



Learning Management System Adoption in Schools: A consideration of the impact on teachers' professional ethics.

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ABSTRACT

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During the COVID-19 pandemic Google Workspace for Education (GWfE) became key to continued education. Google's Learning Management System (LMS), being so simple to implement and use during online learning, drastically changed the delivery of education. Due to the open-endorsement of governments worldwide, it was implemented exponentially in both private and public education. GWfE provided educational stakeholders in the Czech Republic and England with most basic services and this also facilitated its fast implementation in secondary schools. Yet a consideration of stakeholder and societal impacts was idle and by giving a less than fully ethical company complete access to secondary schools without due diligence, a rushed and uncautious implementation of this LMS can be seen as naive and short-sighted.

This study examined the impact that the use of GWfE had on teachers' professional ethics and data safeguarding in two secondary schools in England and two in the Czech Republic. To gain a fair understanding of its impact, through a blended approach, the study collected qualitative data through interviews with five educational leaders working in four different secondary schools and quantitative data through an online survey administered to 73 educators directly working with GWfE. The analysis of this data was based on the theoretical background of the educational context, educator competencies and digital literacy in both countries. Research findings showed that, mostly due to the COVID-19 pandemic, the use of GWfE had exponentially increased, and during this time, stakeholders' voice was rarely consulted. Secondly, due diligence was not applied in most cases before and during implementation. Thirdly, an ethical analysis of the platform was rarely done prior to implementation. Fourthly, the implementation of GWfE had restricted stakeholder autonomy through its use.

Finally recommendations were made for further areas of study and to increase due diligence regarding edtech tools in secondary schools and improve digital literacy for all stakeholders in order to negate some of these negative consequences regarding educators' ethics.

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Keywords: Learning Management System (LMS), Big Data, Edtech, Data Ethics, Leadership, Professional Ethics, Datafication.

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1. INTRODUCTION

1.1 Research topic

The use of educational technology (edtech) in secondary schools over past years has been expected to increase exponentially (Davies & West, 2017; Waxman et al., 2013) and the potential benefits of such integration can at times seem endless. Increased use of educational technology often brings the intended benefits of enhanced learning, the opportunity to bring educators and learners closer together and to also increase parental involvement (Olmstead, 2013). However no one could have predicted a dependency or an almost absolute reliance on these systems before the COVID-19 pandemic began, nor foreseen any potential risks and pitfalls that this rushed integration may bring with it.

Educational technology companies became absolutely key in continuing education during the first COVID-19 lockdown. Private Learning Management Systems (LMSs) like Google Workspace for Education (formerly Gsuite for Education) or Microsoft Teams for Education saw their user base grow exponentially thanks to their free-to-use (or almost free-to-use) marketing and the open endorsement from various governments and ministries of education worldwide. This governmental decision in response to the national unpreparedness to a full pivot to online learning enabled edtech services to launch fast implementation to facilitate learning during this period. Google Workspace for Education (GWfE) rose to the challenge and has regularly updated their tools to reinforce their position.

Yet a rushed and uncautious implementation of a private LMS or extension of its use and importance within schools may be seen as naive and short-sighted, given Google LLC's and Alphabet Inc's lack of ethical considerations regarding data privacy in other contexts and its potential to limit teacher autonomy. This study explores the rise of GWfE not only as a solution to online learning but also the prospective issues surrounding the changes and challenges to teachers'

professional ethics regarding the increased use of these systems. Furthermore, the benefits and concerns regarding the uncautious adoption of edtech tools provided by companies with questionable ethical records are examined in this thesis.

This study examines how high school teachers understand and perceive the changes in their professional ethics and competencies and the risks involved in those changes in regards to the context of their school, stakeholders through their use of GWfE. This topic is of importance as it explores the intricate relationships regarding the use of these technologies, the end-users' ethics and the perspectives of these changes particularly in the context of the catalyst of the COVID-19 pandemic.

With use of governmental policy documentation and European Union guidance documents the researchers have attempted to gain a conceptual understanding of the overarching ethical practices and professional expectations of secondary school teachers in regard to the use of educational technology. Through this the researchers have tried to understand the perspectives of educational leaders within schools and the actual practicality of the application of these ethics and competencies. In other words the researchers wish to paint a picture whether or not guidance and policy are being adhered to on the ground and whether this is an actual possibility regarding the massive technological transformation that education has undergone in the past two years. The study also seeks to understand whether or not there are gaps and misconceptions between educational leaders and frontline teachers and the policy documents in order to understand whether or not these systems are reviewed in terms of their safeguarding, overall reliability, data protection and long-term risks.

Such a study also proves useful to the researchers as they are both educational practitioners at secondary school level and hold positions where the use of these systems are involved either in the development or the administration of safeguarding policies, privacy policies or GDPR. Therefore it is seen as useful to explore these issues not only to share the findings with educational leaders within the establishments for the improvement/creation of school edtech

implementation/vetting policy but to also share the findings with companies and establishments which our schools have partnerships and contracts with in order to provide feedback of teachers' perceptions to aid their future development of such systems. Overall, for the researchers, the knowledge and understanding gained from this project was seen as beneficial to develop synthesis and reflection within the topic and to identify additional topics for further investigation.

1.2 Research questions

This study was directed by the following main and supplementary research questions;

How does the use of Google Workspace for Education impact teachers' professional ethics?

Supplementary Research Questions:

- A. To what extent are teachers' professional ethics and competencies considered before the implementation of Google Workspace for Education in secondary schools in England and the Czech Republic?
- B. To what extent are teachers' ethics and competencies impacted by the implementation of Google Workspace for Education in secondary schools in England and the Czech Republic?
- C. To what extent do school leaders consider data safeguarding of stakeholders when implementing Google Workspace for Education in England and the Czech Republic?

1.3 Research approach

Learning management systems (LMSs) exemplify the logic of society becoming centralised through technological means, bringing all external and internal societal values under the power of whomever values them most as expressed by the Frankfurt School (Held, 1980). In the process, educational stakeholders

become consumed and social movement is diminished in that the subject cannot emancipate themselves. Hence in Adorno's words (2006) "The subject still feels sure of its autonomy, but the nullity demonstrated to subjects ...is already overtaking the form of subjectivity itself." (p.15). Foucault (1988) states that

"A critique is not a matter of saying that things are not right as they are. It is a matter of pointing out on what kinds of assumptions, what kinds of familiar, unchallenged, unconsidered modes of thought the practices that we accept rest. (...) Criticism is a matter of flushing out that thought and trying to change it: to show that things are not as self-evident as one believed, to see what is accepted as self-evident will no longer be accepted as such." (p.154-155)

This research may also be viewed under the realm of critical theory and the Frankfurt school for its use of, or suggestion of, Precautionary Theory in the implementation of edtech within secondary schools. In these terms the researchers felt it appropriate to angle this project from the perspective of Critical Theory.

In an age of data surveillance, influenced democratic elections and the blurred lines between what is a child online, the need to be sceptical about edtech is apparent. A cautious approach to the rationales put forth by tech companies for the requirement of certain types of edtech in our schools is justified. The researchers wish to explore and analyse the conditions under which teachers are increasingly being required to submit to the compulsory use of GWfE in tandem with upholding the seemingly contradictory society-defined definitions of what teachers' professional ethics are in England and in the Czech Republic. Morris briefly outlines some fundamental questions that have not only guided this research but have also underpinned its critical narrative;

"How is the production of this tool funded? What influence does the maker of this tool have on culture more broadly writ? What labor is rewarded and what labor is erased? What is the relationship between this tool and the administration of the institution? Who must use this tool

and who is trained to use this tool, and is that labor compensated? These are all important questions to ask, and the answers may play a role in the adoption of any given tool in a classroom or learning environment.”
(Morris, 2018)

This research employed a mixed methods approach to explore the contradictory phenomena of unchecked technocentric solutionism within the lived experience of the stakeholders in secondary schools. Firstly, an analysis of current literature comprising leading academics within this topic, policy documents relating to the use of educational technology and policy documents relating to teachers' professional ethics and competencies. Using themes identified through the literature review, interview questions and survey questions were constructed and framed within the aforementioned themes. These questions then formed the focus for an interview guide to administer semi-structured interviews with secondary school staff in England and the Czech Republic involved either in the implementation or administration of GWfE. A pilot interview was also carried out to aid in the design of the interview guide. Additionally a similar online survey was constructed using the same themes identified from a literature review and distributed to all teachers involved in the utilisation of GWfE. The purpose of this mixed-methods approach was to enrich the quality and accuracy of the data and to gain contextual participant voice. Also this was useful to compare views and perceptions from those most involved in managing the systems compared with that of those of frontline teachers using the systems.

From two sets of data, further themes and relationships were identified and presented to further distil themes coinciding with the literature review. Additionally, some of our hypotheses were contradicted and the evidence to support these contradictions of our hypothesis are identified thereafter.

1.4 Structure of the thesis

Chapter 2 outlines a literature review of past and current literature. The section seeks to clarify differences in the educational systems of England and the Czech Republic and also differences in the expectations of teachers' professional ethics and competencies. This section also seeks to outline the

changes which have happened during the research project in the context of the COVID-19 pandemic and also the historical development of learning management systems, how they have developed, why they have developed and the political variables, apparatus and possible risks associated with using these systems. Chapter 3 presents a methodology which has been briefly outlined in 1.3. Chapter 4 presents the research results from three subsidiary research questions and the main research question. Chapter 5 presents the understandings, the discussions and conclusions gained from chapter 4 and places them into the context of the theoretical framework. It also suggests applications and recommendations based on the findings in chapter four and finally assesses the methodology and evaluates the methods used for further research.

2. THEORETICAL FRAMEWORK

2.1 LMS development

2.1.1 A brief history of the LMS

The earliest use of something which could be described as a learning management system is teaching machines designed in the 1920's by Sidney Pressey (1926). The birth of the Hewlett Packard desktop computer in 1970 enabled further development of the LMS followed closely by the birth of the world wide web in 1982. The last thirty years has seen the development of Softarc's 1990 LMS followed a decade later by Moodle and finally by the contemporary cloud based multiplatform LMSs that we are familiar with today. LMSs have become one of the key pieces of edtech, transforming the practices of learning and teaching in education (Coates, 2006; Falvo and Johnson, 2007; Weller, 2018) particularly after the pivot to online learning during the COVID-19 pandemic (Lossec et al., 2020; Curcher, 2020; Teräs et al., 2020; Williamson & Hogan, 2020; Williamson, 2021).

While LMSs have reached a high level of adoption in many countries, and exponentially so during the COVID-19 pandemic, they are most ubiquitous in higher education (Piña, 2013). Nowadays, LMSs can be divided into two business model groups, commercial and open source. WebCT was one of the earliest commercial LMSs, developed in 1995 at the University of British Columbia (Business Wire, 2012). At its peak, WebCT was the most widely used LMS globally with over 10 million users in 80 countries (Chan, 2005) before it was acquired by blackboard in 2005. Open-source systems were formed with a vision of having the source code available to institutions free of charge. These systems were popular with universities who would download the source code and adapt it to their own specialised needs. A good example of one of these open source platforms is Martín Dougiamas' Czech/Austrian based Moodle platform (**M**odular **O**bject **O**riented **D**ynamic **L**earning **E**nvironment) which is one of the biggest in use today. Launched in 2002, the system was established centred on a constructivist pedagogy underlining the role of learners as not just consumers of content but also creators and editors.

Commonly used acronyms

There are many terms related to e-learning and the technologies that have been developed to support it. One area of misunderstanding is in the definition of the acronyms, in particular, CMS and LMS, the terms are often mistakenly used synonymously. For example, the term CMS is often associated with two markedly different technologies: “content management systems” and “course management systems.” The former is used to manage and store learning content whereas the latter is used to guide learners (usually independently) through an online or blended course. LMS, is a term which is commonly interchanged for course management systems (CMS), virtual learning environments (VLE) and a vast array of other acronyms. LMS is now an umbrella term for numerous types of online learning systems and although most of these systems seek to facilitate learning, there must be distinctions made as not all systems exhibit common features. For a brief summary of some of these acronyms as outlined by Watson and Watson (2007), see appendix 1.

It is difficult to grasp where CMSs begin and where LMSs begin and blurring the picture even more is the fact that many users and establishments regard the terms synonymously as certain common themes between them can be ascertained such as the focus on personalised and individualised learning. In the remainder of this review, the term LMS will be the only acronym used to refer to the online learning platform in the focus of this paper, Google Workspace for Education and Google Classroom.

2.1.2 The modern LMS

The LMS was originally used to describe the administrative system of the PLATO K-12 learning system (Watson & Watson, 2007). Put briefly, an LMS is the structure that distributes and manages educational content and assessment data. It tracks and produces data for administering the learning procedure of an organization (Szabo, 2002). LMSs are generally structures which support the process of eLearning which can be defined as;

...the use of electronic media for a variety of learning purposes that range from add-on functions in conventional classrooms to full

substitution for the face-to-face meetings by online encounters (Guri-Rosenblit, 2005, p.469)

Or;

...the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services, as well as remote exchange and collaboration (Alonso et al., 2005, p. 218)

Characteristics outlined by Watson and Watson (2007) of the modern LMS include the following;

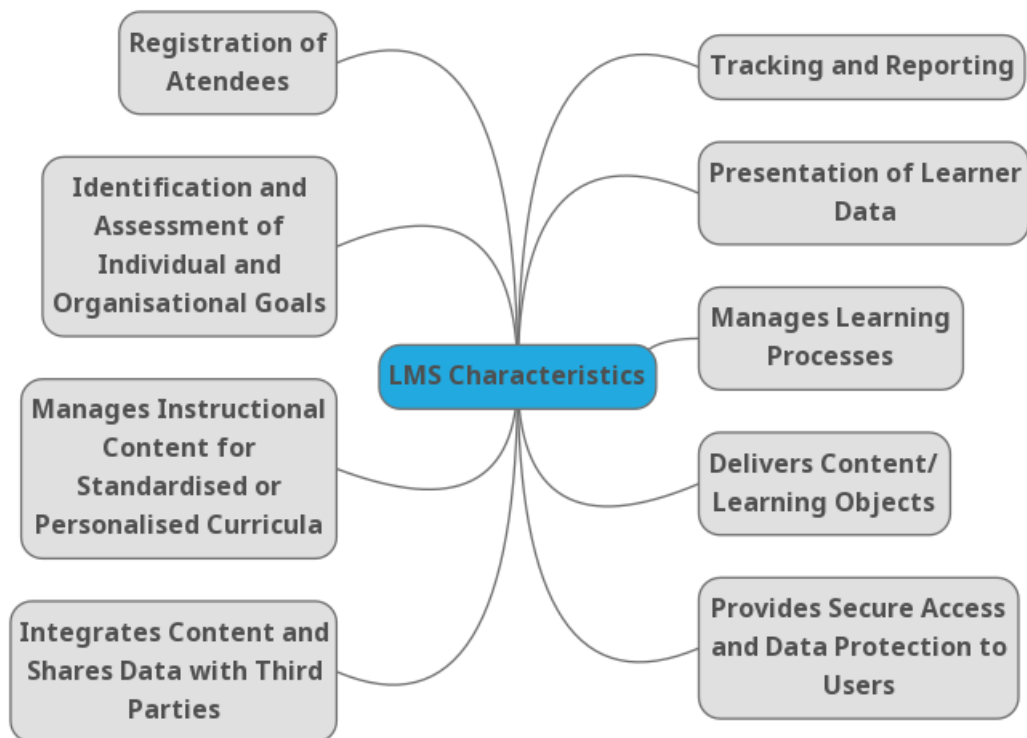


Figure 2.1.2 Characteristics of the modern LMS

Most of the agreed upon advantages of LMSs are that they;

- Centralize learning and ensure consistency for all learners in tracking, instruction and format. Tracking also enables more targeted and effective interventions.
- Are open access (free to use their basic services) with the choice to buy licenses for additional content and services to enhance the LMS.

- Ensure content and LOs (learning objects) are readily available for learners and are reusable and adaptable for instructors once uploaded.
- Are accessible for leadership in order to appraise staff or supervise learners.
- Offer increased communication and interaction, not only closing the gap between instructor and learner as feedback becomes instant but also increasing peer interaction.
- Enable ubiquitous access (even on smartphones) and are increasingly integrating apps, websites and features into their systems to diversify the learning process.
- Ease of course management for instructors for example, integrated grade book for summative assessment with optional transparent grading (i.e. students and teachers can both see the real time grade)
- Allow students who missed lessons to view material online to catch up or prepare for the next class and allows instant access to class materials for students who did not fully understand the physical lesson or for the purpose of revision at a later date (Garyfallidou & Ioannidis, 2019)

Dutton et al. (2004) outline a classification of “Six patterns of use” for LMS established on a university-wide research project. The patterns range from least to most cohesive use of the LMS within the classroom (p. 75-76):

Level 1:	<i>eCopier: Substituting the photocopier:</i> Use of LMS to give students access to documents online rather than handing out hard copies in class
Level 2:	<i>ePublisher: Distribution of enhanced course e-content:</i> Enhancing classroom by including multi-media items such as YouTube videos and articles

Level 3:	<i>eProjector: Substituting the overhead projector:</i> Access to images that could once only be seen in a museum or in textbooks
Level 4:	<i>eProject: Online Group work:</i> LMS can function as an online forum for students to read, post and offer feedback on each other's work
Level 5:	<i>eTeam: Innovation in student groups:</i> Students post, discuss, post materials, creating voluntary virtual study groups around a developing group reading list.
Level 6	<i>eClassroom: Substituting the virtual for the real:</i> Students blend their learning, only meeting in school a few times, spending most of their time using the LMS to manage individual and group work.

LMS use in primary schools by Edmunds, B., & Hartnett, M. (2014) found that the scaffolded use of an LMS did overall, improve learning through increased communication and feedback and particularly aided an Assessment for Learning based pedagogy. This technology has the advantage of moving learning beyond the classroom and particularly in facilitating the sharing of links, commenting on links (Curcher, 2010). It is however noted that students can become confused and frustrated when presented with a multitude of online platforms that they must use in combination with an LMS (Curcher, 2010; Mašek, 2020).

2.2 Educational context

In the pre-digital age, data was suggested to aid governments gain an accurate statistical model of a society in order to improve, respond and intervene within

the education sector (Ambrose 2015; Beer 2016, Williamson, 2019). Presently, datafication is the transformation of everything and anything into the digital medium (Cukier & Mayer-Schoenberger, 2013). In 1960s England, the societal role of education changed through the further implementation of standardised examinations, which resulted in the introduction of a gradation system (O-level/A-level) and ushered in a new era of school based accountability. In the 1970's, Thatcherism transformed schools towards a much more businesses-focussed model through the introduction of further accountability and competition facilitated by school league tables. This accountability was not only imposed on schools but also on teachers which thus enabled the conditions for datafication and learnification to grow (Biesta, 2010). Indeed by turning students and their assessment into numbers, it is easier to provide deductive evidence to prove that learning is occurring to allow schools to compete effectively in the league table ecosystem. This also provides increasingly strict/restrictive criteria through which schools and teachers must adhere to in order to prepare students to gain the appropriate level of evidence to compete.

2.2.1 Teaching and learning in England

To understand the use of GWfE it is important to understand the context of its necessity within the respective education systems. As readers of this report are most likely from an international background, the researchers thought it necessary to outline the basics of each educational system to understand not just the context of implementation but also to help highlight potential future implications of said implementation based on historical trends. Regarding the current educational system in England, it is important to look at LMS evolution from a holistic societal, political and market perspective.

The change from learning for life, to learning for work

Education in England is compulsory for all children aged 5 to 18 and nursery (kindergarten) is optional. The leaving age was increased from 16 to 18 by the 2008 Education and Skills Act in order to get students to leave with either

A-Levels or vocational training qualifications. State schools are funded by taxes though government spending over the last ten years has seen a sharp decline despite the number of students rising (Adams, 2019; Britton et al, 2019). Additionally, annual continued professional development provided to teachers has seen severe cuts since 2017 and the staff development budget has seen a decrease of 12% in secondary schools and 7% in primary schools (Busby, 2019a).

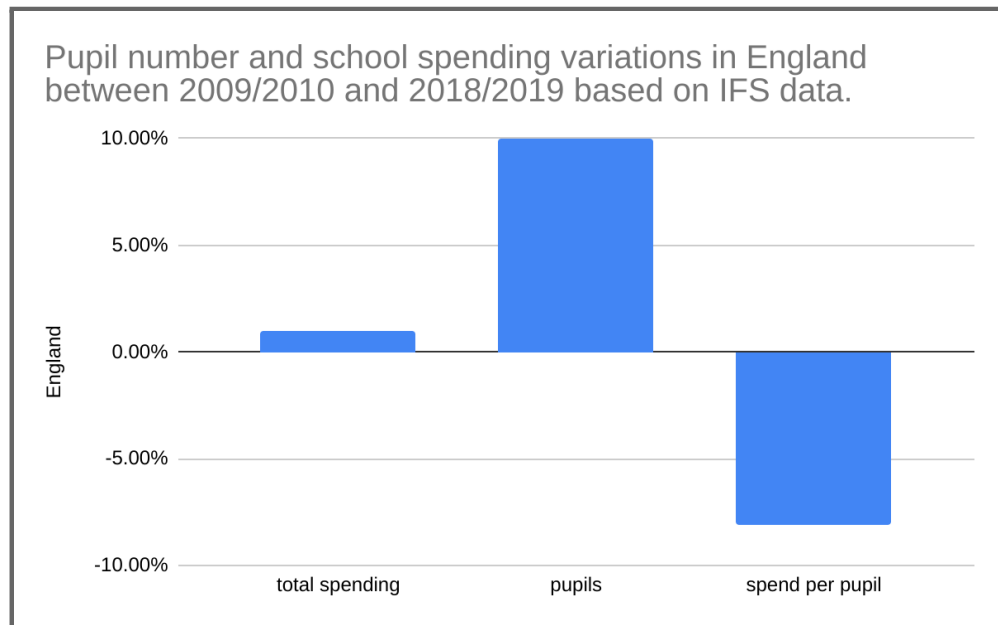


Figure 2.2.1a Pupil number and school spending variations in England between 2009/2010 and 2018/2019 (Adams, 2019)

A brief look into British political and economical history can explain the current picture of education in England. As Howard Stevenson noted, the current education system in England is a “realisation of the 1988 project” (2011, p180), referring to the 1988 Education Reform Act. Throughout Margaret Thatcher’s eleven years in government, the 1980 Education Act twinned with the 1988 Education Reform Act gave parents an opportunity to choose their children’s school. This transformed secondary education into an attainment based, multi-layered, competitive system while simultaneously diminishing the powers of the local education authorities. Some may argue that this changed the status of English schools from state-funded organisations with a focus on personal development into semi-private, sponsored organisations ranked by attainment

whose aims are to complement the economical development of the nation-state (Bell & Stephenson, 2006).

Key Stages and further standardised examinations were introduced, such as the General Certificate of Secondary Education (GCSEs) in 1986 which replaced O-levels. Teachers were also introduced to new pay conditions based on the 1987 Teachers' Pay and Conditions Act which imposed a new salary system and conditions of employment based on accountability (McVicar, 1990, p136) which then evolved into the current Teachers' Standards document (Department for Education, 2011). In 1992 school league tables were officially published by the government to provide stakeholders with "a summary of the average educational performances made by pupils in each state-funded secondary school" (Leckie and Goldstein, 2017).

The legacy of The 1988 Education Reform Act resulted in the 2010 introduction of the Ebacc (English Bachelorette) which includes English, Mathematics, Science, a Modern or Ancient foreign language, and either History or Geography. This would result in schools steering students with lower or middle abilities toward mainstream Ebacc subjects rather than professional colleges (Newton et al., 2018). This new quantitative approach to education was intended to further mainstream education through standardisation, increased centralisation and inter-school competition facilitated by league tables. In England, it could be perceived that the evidence for learning equals a progression in attainments of students and additionally implies that teaching can also be measured in a similar 'good or outstanding' method (Ofsted, 2018). As Biesta (2014) would note, this vision of learning is problematic as it puts students as "merely willing objects of intervention, rather than thinking and acting subjects who carry responsibility for their part of the educational process" (p. 230).

Teaching standards in England

Teaching and learning are words often associated with accountability and responsibility. At the time of writing, English schools continue to move to further

resemble corporate institutions through further appraisals of staff, school inspections to identify poor achievements and to satisfy stakeholders (Jones, 2013). In 2012, the Teaching Standards were introduced in England by the Department for Education (DfE) to ensure clear guidance and expectations regarding the professional practice and conduct of teachers were implemented (Department for Education, 2011). They replaced and combined the 'Standards for Qualified Teacher Status' and the 'Core Professional Standards', previously published by the former Training and Development Agency for Schools" (Department for Education, 2011). These standards were put in place in order to achieve a higher level of teaching and learning through applying them consistently throughout the profession and by creating a higher level of accountability and safeguarding. As defined by the English school inspectorate (Ofsted, n.d.), safeguarding is the protecting of children from maltreatment, impairment of health or development, ensuring development in circumstances consistent with the provision of safe and effective care and taking action to enable all children to have the best outcomes. As such these Teaching Standards are used for:

- Assessing prospective teachers in training courses, to achieve Qualified Teacher Status (QTS)
- Appraising Newly Qualified Teachers (NQT) during and after their induction period into the profession.
- Assessing the quality of teaching in schools by Ofsted (the English school inspectorate body) (NASUWT, n.d.).

These standards are divided into three clear sections, the first one is the "preamble", which summarises the values that teachers should uphold, the second regards teaching and contains eight subsections regarding the standards that each teacher must abide by and the third includes personal and professional conduct.

Section 2: Teaching Standards	Section 3: Personal and professional conduct standards
<ol style="list-style-type: none"> 1. Set high expectations which inspire, motivate and challenge pupils 2. Promote good progress and outcomes by pupils 3. Demonstrate good subject and curriculum knowledge 4. Plan and teach well structured lessons 5. Adapt teaching to respond to the strengths and needs of all pupils 6. Make accurate and productive use of assessment 7. Manage behaviour effectively to ensure a good and safe learning environment 8. Fulfil wider professional responsibilities 	<ol style="list-style-type: none"> A. Treating pupils with dignity, building relationships rooted in mutual respect, and at all times observing proper boundaries appropriate to a teacher's professional position B. Having regard for the need to safeguard pupils' well-being, in accordance with statutory provisions C. Showing tolerance of and respect for the rights of others D. Not undermining fundamental British values, including democracy, the rule of law, individual liberty and mutual respect, and tolerance of those with different faiths and beliefs E. Ensuring that personal beliefs are not expressed in ways which exploit pupils' vulnerability or might lead them to break the law F. Teachers must have proper and professional regard for the ethos, policies and practices of the school in which they teach, and maintain high standards in their own attendance and punctuality G. Teachers must have an understanding of, and always act within, the statutory frameworks which set out their professional duties and responsibilities

Figure 2.2.1b: Summary of Teaching Standards in England.

2.2.2 Teaching and learning in the Czech Republic (Czechia)

Education in the Czech Republic has a long, colourful history. Prague, the capital city, is home to one of the oldest universities in central Europe, Karlovo University, established in 1348. In the years since, unlike England, the Czech education system has been influenced and transformed more than once by outside actors such as the Hapsburg Empire, National Socialism and Communism. The current structure of the primary and secondary education system is quite typical for a central European state. Children begin compulsory education at the age of 4-5 in *Materská škola* (literally translated to 'Maternal School'), children then move to *První Stupeň Základní školy* (first stage of primary school) from grades 1-5. Following this they move to the *Druhy Stupeň* (second stage) from grades 6-9 or through examination can attempt to gain admission to an eight-year *Gymnasium* (grammar school). The majority of Czech students who finish the second stage of primary school then have several options, they can apply (usually through examination) to four-year *gymnasiums*, technical secondary (vocational) or arts schools where they sit examinations to gain their school leaving certificate named the '*Maturita*'.

Major differences between the Czech and English systems are as follows;

- Czech primary schools consist of 9 years, in England it is 7.
- Unlike the U.K., it is more common practice for schools to delay the progression of students to the next grade for cognitive, emotional, developmental reasons, consequently some Czech students may gain their Maturita between the ages of 18-21.
- Differing from U.K. high schools, their Czech equivalents become quite specialized in the final four years and students either pursue traditional academic subjects, vocational or the arts in specialized schools.
- Generally speaking, funding for education and teachers' salaries are much lower in comparison in the Czech Republic.

In 1965, according to the Czech Statistical Office the then communist state budget subsidized 90% of the cost of education (accommodation, lunches, learning supplies etc) and the remaining 10% was found from parents and students. Comparatively in 2015, the state covered 70% of these costs and predictions show that funding for public education will decrease. Additionally, in 2018, the Czech Republic ranked 27/28 member EU states in regards to its expenditure on teachers' continued professional development (Löwenhöfferová, 2018). This trend of defunding and stagnation of funding is worrying, compounded with the exponential rise of private education. Promisingly, the government has pledged to increase teachers' basic salary to €1700 per month by the end of 2021 from €1400 in 2019 and under €1000 in some areas in 2017. In terms of equal access to education, particularly in elementary schools run by the municipalities, parents pay taxes to subsidise schools within the districts. Parents do not pay directly to schools, but to private companies who collaborate with schools. In this respect, equal access to education is seriously flawed (Löwenhöfferová, 2018).

The implementation and use of digital technologies within the Czech public education is currently a trending topic. Between 2016 and 2017, the Czech School Inspectorate (ČŠI) published a bruising survey describing a particularly dire situation within the country regarding digital technology in schools. It goes on to describe that staffing was insufficient, computers were outdated and connections were limited, and the situation critical. In the main findings section they describe that funding was inefficient and often when funding was available

for strategies to implement new technologies it was dictated by the private actors who supplied the technology.

The inspectorate recommended that the following minimum standard be followed;

- The school must formulate an ICT strategy (in any form), which it has updated in the last year.
- The school has its own ICT administrator, either for the main employment or part-time/self-employed.
- More than 50% of teachers have their own computer or other equipment.
- Computers (or other appropriate facilities) for students are replaced every seven years.
- The school is sufficiently covered (at least 60% of classrooms) by an internal network to connect computers or other devices.

There is much debate surrounding the financing, efficacy and training of staff regarding edtech, however, there is a lack of discourse surrounding child safeguarding and teacher accountability. Recently, the department of education announced a drive to implement more ICT classes into the curriculum in order to drive the knowledge and understanding of students (EU Schoolnet, 2012).

Teaching Standards in the Czech Republic

In the Czech Republic, teacher training is also a contemporary topic of debate. Generally, teachers in secondary schools either obtain a pedagogical degree through one of the faculties of education in the universities or they possess a masters degree in their subject area and are then inducted with the premise that they will complete an accredited pedagogical training program (MŠMT, n.d.-a).

In regards to teaching competencies, to summarize, the situation in the Czech Republic is slightly more blurred than in England as there are no clear set statutory competencies for teachers. Until 2009, there was little in the way of any type of standardized teaching competencies in the Czech Republic. At the time, deputy education Minister Jindřich Kitzberger stated 'attempts to define the standard of the teaching profession had not been successful in the past' (MŠMT & Kitzberger, 2009). However, following a public discussion describing

standards as a 'novelty', the following was suggested to perceive how achievable these standards should be. Teachers would;

- receive professional help and support for improvement (e.g. mentors)
- gain certainty about what is expected of them
- understand each other better in the profession (instill common language within the profession)
- explain more easily the public's own work (especially to parents and founders), defend it with support in the standard

(MŠMT, 2009)

Teachers were invited to join the discussion on this topic and complete a questionnaire which would then be used along with public, academic and ministry feedback in order to form teaching standards. However, not much has been developed since at a ministerial level.

Official national discussion on the matter of teaching competencies started in 2009, the standards were supposed to be a part of the 'career code' (Kariérní řád), however, the parliament declined to make them statutory in 2017. The government at the time did manage to add (Zákon č. 563/2004 Sb, n.d.) a generic amendment to the law regarding the 'career code' (MŠMT, n.d.-b) which requires schools to decide on the prerequisites for moving from level to level in the teacher career levels using the 'Career Path Development of professional competencies in the career system of the Czech teachers' (Kariérní cesta rozvoje profesních kompetencí v kariérním systému učitelů ČR) guidance document. However, this document is more focussed on the progress of teachers from career level to career level and the necessary professional competencies to move to the next salary level, the definition of the standards of teachers remains in the hands of school principals and teachers, including the ethical principles of the profession. Nevertheless, different documents exist within pedagogic faculties in various universities in the Czech Republic, for example Masaryk University (second largest university in Czech Republic) have the 'Quality Standard of Professional Competencies of a Teaching Student' document (Kratochvílová et al., 2020) which explicitly outlines and lists the knowledge and understanding required for trainee teachers and also acts as a guide for current teachers to monitor their own progress as professionals.

In addition to this, there are a number of NGOs involved in campaigning for improvements in the situation of pedagogical standards, such as Otevřeno (Open) a federation of students, professors and other members who campaign for the better training of teachers.

In general comparison with England, Czech teachers do not have the same strict syllabi nor inspections that their English colleagues must endure. This may or may not be a factor in how explicit English teaching standards and curricula are in comparison with Czech counterparts and may also play a part in the differences in salary and funding, this is perhaps a further research question for another time.

2.3 Professional ethics and edtech use

The Durkheimian sociological notion of professional ethics was to analyse the creation, evolution and outcomes of a society's code of conduct (1957/1992, p.1). Nowadays, the acknowledgement has been made that through competition (Abbott, 1988, 1998, 2001) and by association with social institutions (Freidson, 1986, 2001), professions gain, maintain, and lose power (Yeaman, Eastmond, Napper, 2013). A code of conduct cannot enforce good behaviour but serve as an example towards self-regulation to the moral recommendations, which Foucault called "subjectivation" (1988) as it enables connections between one group and avoids individualistic mentality in the workplace (Merton, 1982, p. 206). Currently cultural standards based on politics and societal traditions are the foundations of professional ethics for educational technology.

To be able to evaluate educational technology ethically, one must possess an understanding of the tool system/process. Heinich noted that technology brings visibility to instruction (1970, pp. 157–163). Using visual cues or materials brings a more concrete understanding of the actions (p.159) which within the context of edtech development may lead technologists to evaluate their relationship to professional ethics and hence reassess its implementation, resulting in a better understanding of the technology. As Yeaman, Eastmond & Napper observe (2008, p. 316) "Professional ethics makes educational

technology visible” as it is evaluated against the ethical principles embodied by its developers and also its users. The technologists and their conscience is currently one of the major safeguards against ethical violations in the edtech sector (Januszewski et al., 2001).

Digital literacy is a contemporary part of civic participation and can not be the privilege of a few. Technologies are now part of our everyday life therefore to engage in civic life and to make informed decisions, one requires functionality to acquire information (Giroux, 2017; Lund & Carr, 2008, p. 14). Therefore to understand this power imbalance between the highly digitally literate edtech developers and school stakeholders, it is necessary to evaluate the competencies and expectations for teachers and senior managers alike when adopting and implementing edtech tools in schools.

2.3.1 Czech Republic (Czechia)

In the Czech Republic there are no explicit nor statutory competencies regarding edtech use or ICT, however, guidance documentation exists adopted from the European Framework for the Digital Competence of Educators (DigCompEdu) (Redecker 2017; Ghomi, M., & Redecker, C. 2019). The Czech Curriculum portal website (rvp.cz) which is operated by the National Pedagogical Institute of the Czech Republic in partnership with the EU and Ministry of Education, promotes this initiative ‘DIGCOMP EDU’, where;

“...the DigCompEdu Framework is to reflect on existing programs or tools and to synthesize them into a coherent model that will enable teachers at all levels to clearly assess and develop their pedagogical digital competencies.” (Teacher 21, n.d.)

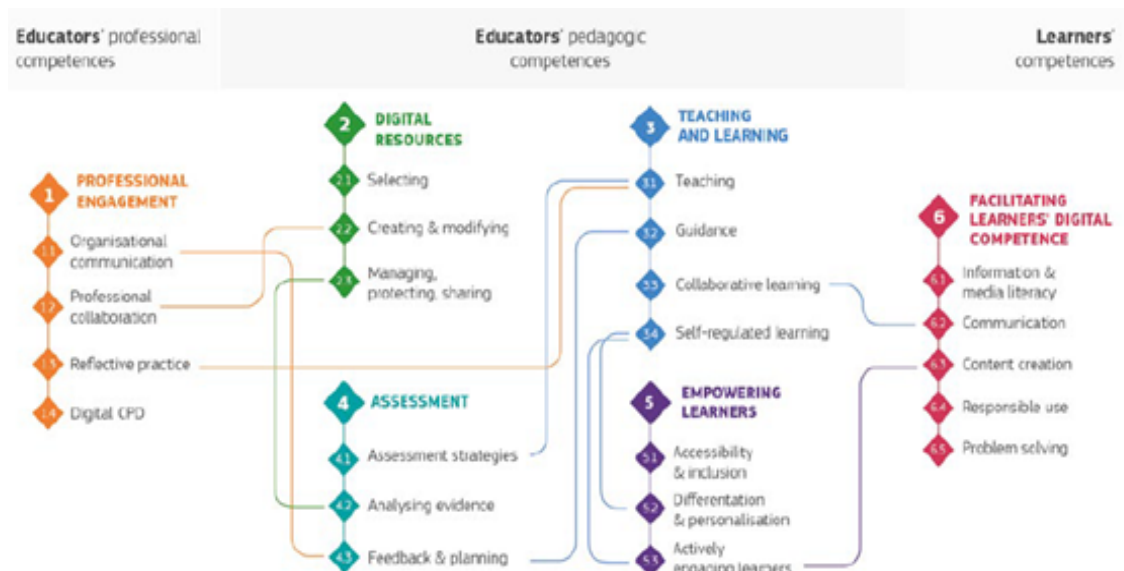


Figure 2.3.1 The DIGCOMPEDU Framework (Redecker, 2017)

This framework proposes a progression model to enable educators to assess and improve digital competence. It outlines different stages through which an educator's digital competence habitually develops. These stages are organized like the CEFR (Common European Framework of References to Languages) in that they begin with 'Newcomer' (A1) and 'Explorer' (A2) where educators incorporate new information and utilize basic digital practices then moving to 'Integrator' (B1) and 'Expert' (B2), where educators apply, expand and hone their digital practices and then peak with the highest stages, 'Leader' (C1) and 'Pioneer' (C2), where educators are expected to pass on their expertise, critique existing practice and policy and cultivate new practices. The criteria to meet this level states;

Pioneer (C2):

Pioneers question the adequacy of contemporary digital and pedagogical practices, of which they themselves are Leaders. They are concerned about the constraints or drawbacks of these practices and driven by the impulse to innovate education even further. Pioneers experiment with highly innovative and complex digital technologies and/ or develop novel pedagogical approaches. Pioneers are a unique and rare species. They lead innovation and are a role model for younger teachers. (Redecker, 2017 p.30)

One could argue the last sentence may be slightly inaccurate as some might see the pioneer level population comprising a higher % of younger teachers being role models for older 'digital immigrants'. The framework is quite generic as it is directed towards educators from all levels of education and needs to be adapted to context and purpose.

This framework outlines 22 competencies within 6 areas;

1. Professional Engagement
2. Digital Resource
3. Teaching and Learning
4. Assessment
5. Empowering Learners
6. Facilitating Learners' Digital Competence

Of these 22 competencies, some have more relevance than others regarding the research questions of this research, namely;

competence	Description
Competence 1.1- Organisational communication	To use digital technologies to enhance organizational communication with learners, parents and third parties. To contribute to collaboratively developing and improving organizational communication strategies.
Competence 1.2- Professional collaboration	To use digital technologies to engage in collaboration with other educators, sharing and exchanging knowledge and experience, and collaboratively innovating pedagogic practices.
Competence 2.1- Selecting digital resources	To identify, assess and select digital resources for teaching and learning. To consider the specific learning objective, context, pedagogical approach, and learner group, when selecting digital resources and planning their use.

<p>Competence 2.3- Managing, protecting and sharing digital resources</p>	<p>To organise digital content and make it available to learners, parents and other educators. To effectively protect sensitive digital content. To respect and correctly apply privacy and copyright rules. To understand the use and creation of open licenses and open educational resources, including their proper attribution.</p>
<p>Competency 5.1 - Accessibility and inclusion</p>	<p>To ensure accessibility to learning resources and activities, for all learners, including those with special needs. To consider and respond to learners' (digital) expectations, abilities, uses and misconceptions, as well as contextual, physical or cognitive constraints to their use of digital technologies</p>
<p>Competence 6.3- Digital content creation</p>	<p>To incorporate learning activities, assignments and assessments which require learners to express themselves through digital means, and to modify and create digital content in different formats. To teach learners how copyright and licenses apply to digital content, how to reference sources and attribute licenses.</p>
<p>Competence 6.4- Responsible use</p>	<p>To take measures to ensure learners' physical, psychological and social wellbeing while using digital technologies. To empower learners to manage risks and use digital technologies safely and responsibly.</p>

(Redecker, 2017 p. 24-25)

For each of the competencies outlined above, there are proficiency statements outlined to help teachers define which level they are.

Generally speaking, this framework is coherent, easily accessible and comprehensive regarding the competencies that Czech/European educational practitioners should strive towards, however, in the experience of one of the researchers who has visited many and worked in the Czech public secondary school system, the application or even existence of this framework was a novel discovery following this literature review. This begs the question of whether or not this non-statutory framework is actually being utilised in Czech secondary schools.

2.3.2 England

To be able to understand the teacher expectations related to edtech in the teaching profession in England, it is important to look at first its delivery of ICT education, continued professional development and teacher training. In 2014, the Information and Communication Technology (ICT) curriculum was withdrawn from the National Curriculum, which included the Computing Programme. The rationale of which was that pupils would become digitally literate and would gain the necessary 21st Century skills for future employment (DfE 2016, para 1). Unfortunately, England's efforts to develop digital literacy have been slow and biased. The lack of a united framework (Frau-Meigs et al., 2017, Polizzi, 2020) combined with a political outcome focused on the future societal needs resulted in a poorly integrated skill development in the curriculum, which led to restricted learning (Hall et al., 2013, p 222) as shown in the 2019 Ofcom report into Children and Parents: Media Use and Attitudes (Ofcom, 2019, p 5), which sees 56% users aged 12-15 still not being able to identify paid advertisement on Google search engine results. As Angela McFarlane states in her report analysing the evolution of digital literacy over the last 10 years:

Overall, despite all the activity and investment, there is no shared view of what the digital education agenda is aiming to achieve and what the priorities should be for policy-makers and practitioners (2019, p1)

Worryingly her findings also show no evidence of the efficiency of what is being taught to improve digital literacy in learners. Consequently, with the replacement of the computing science or ICT GCSE in favour of the computing GCSE, student intake has been in steep decline, from 140 000 in 2017 to 130 000 in 2018. Additionally, current year 10 students that have chosen a computer science or design and technology GCSE will be the final and only cohort to be consistently taught about digital literacy (Kemp & Berry, 2019, p14), other student cohorts do not have a set provision and will only be given a few hours during PSHE, on topics like online safety, or in other subjects depending on teachers' knowledge. Furthermore the number of teaching hours in computing has declined in all key stages.

Year	Total Hours of Computing/ICT per week (thousands)			
	KS3	KS4	KS5	Total
2012	70.2	66.4	29.4	166.0
2013	65.3	58.7	28.6	152.6
2014	58.0	51.8	27.1	136.9
2015	56.1	44.4	25.0	125.5
2016	53.6	40.1	22.9	116.6
2017	51.8	35.4	19.4	106.6

Figure 2.3.2a School computing hours. (Kemp & Berry, 2019)

Inevitably this lack of consistent and continual digital literacy education could result in declining skills in this area for prospective and current secondary school teachers in England. A new form of literacy has emerged over the past fifteen years or so called critical digital literacy (Pangrazio, 2016) and to some extent a novel form of the latter called online privacy literacy. Morris and Stommel (2018, p8) outline in their book that critical digital pedagogy:

- centers its practice on community and collaboration;
- must remain open to diverse, international voices, and thus requires invention to reimagine the ways that communication and collaboration happen across cultural and political boundaries;
- will not, cannot, be defined by a single voice but must gather together a cacophony of voices;
- must have use and application outside traditional institutions of education

To become a teacher in England, one needs to apply for a training course and meet the following requirements:

1. hold a degree
2. hold a grade 4 (C) or above in English and Maths GCSEs. (GOV.UK, 2019)

Until 2012, Qualified Teacher Status (QTS) required a test in ICT skills, based on basic skills like word processing, using spreadsheets, databases,

presentation, email and internet searches. After 2012, this was replaced by coursework and presentations submitted by trainee teachers to their training institutions. The aim, according to Falloon (2020, p2451) is for trainee teachers to “develop ‘technology integrated’ units of learning, for practicum work in schools” resulting in effective skills as they get more and more practice (Polly et al. 2010). Coincidentally in 2019, and perhaps to tackle a shortage in the profession, the remaining two teacher training admissions tests on literacy and numeracy were removed and their provision was passed on to training course providers (Busby, 2019b). Besides this, teacher training currently omits critically evaluating the edtech tools, which would raise ethical and safeguarding questions (Foulger et al. 2012; Hinrichsen & Coombs, 2013).

Presently the development of teachers’ digital literacy has been intertwined with its delivery of the students’ curriculum (Borthwick & Hansen, 2017) and the development of technical skills in order to use systems that schools generally use (Admiraal et al. 2016). Yet, as pointed out by Gruszczynska and Pountney (2013) and Falloon (2020), due to the rapid evolution of technologies, digital literacy education needs to be broadened to encompass ‘information literacy’ (Zurkowski 1974), ‘computer literacy’ (Tsai, 2002), ‘internet literacy’ (Harrison 2017), ‘media literacy’ (Christ and Potter 1998) and ‘multi-modal literacy’ (Heydon, 2007) in order to use effectively digital resources in teaching and learning. However, this utilitarian approach is very limiting on skills, design and can be seen as biased regarding different sociocultural contexts for technology use (Gruszczynska & Pountney 2013; Lim et al. 2011; Lund et al. 2014; Ottestad et al. 2014; Falloon, 2020).

In 2019 the government implemented National standards for essential digital skills needed for life and work at entry and level 1 in order to maintain consistency across local and national activity. These standards are divided into categories seen on the graph below:



Figure 2.3.2b Essential Digital Skills from the National Essential Digital Skills Framework (Southwark Council, 2020 p.2)

Yet there is no mention of assessing the digital skills of teachers or even to adopt these new standards into teacher training. The only resources found to provide teachers with training in digital literacy are from external providers, like Futurelab (Payton & Hague, 2011) that date back between 10 to 12 years ago. As a result teachers' digital literacy, despite being key to the profession, does not appear to be a serious priority. Both the teacher education curricula and Teaching Standards, appear to be in need of review and an evolutive digital training provision implemented (Crocker and Dibbon, 2008; Finnish Institute for Educational Research, 2009; Calder and Grieve, 2004).

2.4 The evolution of the private edtech tools in the education sector

Technological solutionism has underpinned the first-aid approach to school closures around the world. Some, like Williamson et al., (2020), view private edtech actors as using the COVID-19 pandemic as a business opportunity to test, prove and profit from the utilisation of their services. As Sandvik and Ikdahl (2021) have pointed out, there are three issues with the mass push to privatised platformization, first that state-facilitated corporate platform ecosystems have

led to discrimination against those who cannot access technology or lack internet access and also that long-term privatisation risks selling education directly to parents and excluding low-income families while excluding the voice of trained pedagogues. For example, a report on the impact of COVID-19 on education by the Special Rapporteur on the right to education (2020, p.2) stated;

The digitalization of education should never replace onsite schooling with teachers, and the massive arrival of private actors through digital technology should be considered as a major danger for education systems and the right to education for all in the long term.

Secondly, delivering educational experience through digitalised platforms is not only about learning but also about improving and developing those tools through tracking and monitoring thus the depth and breadth of data collection and outside actors involved raises serious questions about privacy rights and the wellbeing of children's digital doppelgangers (Bode & Kristensen, 2016; Williamson, 2020). Thirdly, the infusion of private edtech with public education systems risks the private sector gaining influence in moulding educational culture and curriculum through bias learning analytics, commercial interests and algorithms which brings with it questions of democracy and free speech (Williamson, 2021; Sandvik and Ikdahl, 2021; Teräs et al, 2020). For example, in September 2020, an analysis of 496 edtech apps across 22 countries was carried out by the International Digital Accountability Council (2020). Most of these apps were collecting device identifiers; 27 apps were taking location data; 79 out of 123 tested apps were disclosing user data with third parties such as advertising affiliates. This study also revealed that 46% of apps used a "potentially concerning" SDK. These collect data in the background, and are virtually undetectable to the normal person.

To understand fully how learning and teaching are impacted by these technologies, it is important to understand the factors and context which affected each country, particularly with the rapid global progression of the COVID-19 pandemic, each country had to adapt and provide a response to

providing continuous distance education during lockdowns. Below is a short summary of our findings within each context.

2.4.1 England

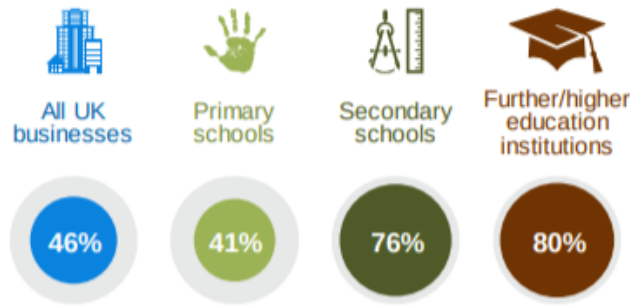
In 2018 the OECD published its Talis report, which states that despite England having 75% of teachers who have been trained to use ICT in lessons, only 41% frequently or always let their students use it in classwork or projects. Besides, 38% were unconfident in helping students with digital technologies and even more surprising only 5% expressed a strong need for continued professional development (CPD). The rapid evolution of digital technologies combined with a demanding workload means that the interest in professional development in that sector is 20% lower than other OECD countries surveyed (Turvey & Pachler, 2020) but it can also illuminate the lack of IT equipment/resources in schools due to severe budget cuts over the past decades (Sibieta, 2020).

In school the lack of importance in Design and Technology subjects means they are only allocated between one 60/90mins lesson per week at KS3 and the fact that they are not part of the Ebacc and only optional subjects at GCSE means that students are not in contact enough with digital technologies, proportionally only 15% school principals reported that the shortage or inadequacy of digital technology for instruction hindered the school's capacity to provide quality instruction "quite a bit" or "a lot", which was lower than the average of the OECD countries participating (OECD, 2018) and shows that access to digital technologies was not a priority. Despite scoring higher than the other OECD countries in students having access to a computer or tablet from time to time, the 2018 report noted that there was inequality of distribution of the necessary digital devices across the population.

When England went into lockdown on March 20th 2020, schools were to only remain open for key workers' children and vulnerable students, the only solution to provide education for the 8.89 million pupils in England was a full pivot to online learning and teaching (GOV.UK, 2020a). The inequity the OECD had mentioned in 2018 became apparent between the provision of private schools and state schools. Indeed the latter had neither the necessary equipment,

resources nor budget or IT knowledge to adequately provide each stakeholder in a matter of days. As a result, the British government decided in April 2020 to openly promote the adoption of private LMSs to facilitate continued online learning by funding schools that would choose either GSuite for Education and Microsoft Teams Office 365 Education (GOV.UK, 2020a) and in August 2020 also promised to acquire laptops, tablets and 4G routers for pupils and students who could not access face-to-face education (Tidman, 2021). To compensate for teachers' lack of edtech knowledge and to help them plan their online lessons with peer-peer support, the government backed Oak National Academy as an online resource hub and promoted the edtech Demonstrator programme launched in 2019 in order (GOV.UK, 2020a). Additionally the government created their own list of links promoting edtech tools and platforms.

Unfortunately, some of these promised provisions made by the government have still not been met, for instance, the laptops/tablets/routers scheme has not yet fully materialised. More worryingly, the role of vetting and risk assessing whether or not edtech platforms in terms of safeguarding and student privacy appears to have been left to teachers to assess whether the online safeguarding of their students' data was in line with the GDPR (2018) and Data Protection Act (2018) while simultaneously providing quality teaching and learning. The DfE as well as other well-renowned organisations like UNESCO in early 2020 provided teachers with lists of online resources, tools and platforms but made sure to use disclaimers to protect themselves whilst footing the responsibility of safeguarding onto teachers (Lossec, Millar, Curcher, & Teräs, 2020). Many instances of data breaches happened during the first lockdown, from Zoom bombings during online classes (McCleery, 2020) to ransomware (National Cyber Security Centre, 2020). The Cyber Security Breaches Survey 2020, noted that secondary schools are more likely to have identified any cybersecurity breaches or attacks in the last 12 months than other typical businesses.



Bases: 1,348 UK businesses; 108 primary schools; 72 secondary schools; 35 further and higher education institutions

Figure 2.4.1 Percentage of organisations that have identified breaches or attacks in the last 12 months (DCMS, 2020)

It should be noted that teachers are expected to safeguard against these types of cyber threats during a full pivot to online learning without considerable training nor time (DCMS, 2020, p.2)

2.4.2 Czech Republic (Czechia)

A 2018 OECD report provides a sound comparison between the Czech Republic and England on the use of digital technology pre-pandemic. Indeed it is interesting to note that 65% of the Czech teachers interviewed rarely promoted the use of ICT to their students for tasks or projects while in England it is the opposite tendency. This can be explained by the lack of formal ICT education in teacher training as noted by 55% of Czech teachers. Yet similarly to England, 37% of Czech teachers felt they could not help students learn through the use of edtech tools which is interesting given the lack of ICT professional development activities. At the time 76% of Czech school leaders felt that they had the right digital provision and sufficient internet connection to provide quality education but surprisingly 13% of Czech teachers felt strongly that they needed training in ICT. This gap between teacher training, ICT provision and the lack of need for ICT professional development activities, can be elucidated by the fact that “effective professional resources designed to help teachers learn how to use digital devices were available” (OECD, 2020, p.3).

On the 11th March 2020 the Czech government imposed its first lockdown and school closures. In order to assess the home learning situation a national

survey was created and conducted online. Findings first reported that teachers' limited edtech knowledge meant that interactive tools were disregarded and email/web platform communication was favoured despite being restrictive (ČSI, 2020). Secondly teachers did send work but without clear explanations, relying on parents to take over (Brom et al., 2020). Thirdly, students in Higher Education and their parents felt a lack of collaboration between teachers as large amounts of work were sent to students. This resulted in students and their parents feeling overwhelmed (PAQ, 2020). Lastly, teachers noted that students were becoming overwhelmed by different edtech platforms in what was referred to as 'technology congestion' (Mašek, 2020).

Currently, to our knowledge, there are no reports outlining the extent to which LMSs have been implemented in Czech schools over the pandemic, however a report from the OECD (2021) outlined that over many parameters of how well prepared Czech students and teachers were for online learning consistently ranked the Czech Republic below the OECD average. Czech school children have now endured one of the longest periods of online learning (almost 10 months at the time of writing). It is possible to hypothesise that a lot of private and public schools have most likely adopted some form of LMS.

2.5 Leadership decisions regarding LMS adoption in schools

Learning institutions now have a wide choice of LMSs and the selection process includes a number of factors including price, subscription costs, staff training, staff needs, student needs, ease of access, usability and the protection of information to name a few (Pappas, 2014). Other factors include the ability to collect biometrics (fingerprints/face scans/iris recognition) and metadata of the users in order to measure attendance, engagement, learning pace and detect dishonest student practices (González-Agulla et al., 2010; Koops 2020). Watson and Watson (2007) argue that there is a lack of research on LMS implementation and use in the public schooling sector and highlight the necessity for larger scale classroom-based studies on implementing the LMS.

A lot of the current literature to date has looked at the topic of LMS evaluation and adoption through the lense of appropriateness for the institution rather than learners (Mohd Kasim, 2016; Stewart, 2007; McMurray, 2017). Moris (2018)

argues that only a minority of institutions include teachers and students in the discourse surrounding the implementation and use of LMSs. In the realm of US higher education, a study revealed that the majority of universities adopted LMSs relying heavily on demonstrations from edtech companies rather than extended trials and 360 feedback from stakeholders (Goodrum, 2016). Further techno-ethical questions provide an analysis of a tool. Educational leaders and educators must ensure to look at the edtech they are using critically, as Morris (2017) points out, the following questions must be asked before and after any implementation of novel edtech;

- How does the tool offer a determinant or a thing that resists our agency to change or resist?
- Why was this tool created? What is its primary objective? What are its other objectives?
- How do the objectives and predispositions of the LMS measure up to my own as an educator?
- How effectively does it suppress my capacity to resist using it or alter or hack it?
- What assumptions about education and learning lie behind the design of this tool? Where do those assumptions come from?

It has been contended that the quick implementation of LMS has occurred in a void of research into their pedagogical effectiveness (Lopes, 2008). LMSs have been noted to influence pedagogy, and therefore student engagement, by knowingly/unknowingly offering default formats that guide educators in the direction of creating courses and lessons in certain ways (Lane, 2008; 2009). Some have argued that the LMSs can often restrict creative pedagogy and limit educators to one or two different types of pedagogic approach, such as constructivism (Weller, 2018). A recent paper by Knox et al. (2020) examines the consequences of the interactional learning and 'learnification' between humans and machines, and the funneling of human decisions through 'digital choice architectures'. Knox et al.(ibid), warns that future education may move to specific forms of 'behavioural governance' which results in necessitating blends of radical behaviourist theories and machine learning systems, that could limit student autonomy and therefore intervening in pedagogic development and attempting to shape learner behaviours in anticipatory ways. For example,

some approaches may be hindered due to a lack of social interaction and some digital immigrants may find the use of technology overwhelming or restricting and therefore this may limit their creative approach to learning, but on the other side of the coin, some may view it as a new type of neo-connectivism with the ability to connect those from different countries and cultures such as with the use of massive open online courses (MOOCs). If LMSs are influencing pedagogy, then most likely they are also affecting student learning and engagement (Coates et al., 2005). Lastly, it is important to note that teachers should be careful not to use the diagnostic engagement data nor summative assessment data from LMSs as a deductive assessment of students without proper consideration of the socio-emotional nor domestic context of the student. Beer et al. (2010) note that;

A systems scan of user behaviour within an LMS can never describe in full how they are engaging in the use of the online environment for teaching and learning (Heathcoate & Dawson, 2005). For example, student grade is not necessarily indicative of learning but is indicative of the students meeting assessment criteria that may or may not be a measure of effective learning. Similarly, class attendance has been used as an indicator for engagement in face-to-face classes (Douglas & Alemanne, 2007) but it does not indicate the quality of engagement or even learning. (p.8)

Furthermore, interactions provided on the LMS are individualist, where the learner is liable to participate with learning material without prompting or instruction. Thus students who necessitate extensive instructor direction may find difficulty with a learning environment that demands a level of self-discipline (Douglas & Alemanne, 2007). Results from a 2015 study (Bergen et al.) in secondary schools showed that students using VLEs (Virtual Learning Environments) showed some differences in motivation to use online technologies, feedback and satisfaction with access to technology, as compared to non-users. Additionally, teachers using VLEs changed their instructional practices compared with traditional classroom teaching. There was also evidence that using VLEs blurred the line between school and home for both students and teachers.

It should be noted that LMSs are often designed without the input of educators, for instance, two comparable research papers in LMS use in 2016 and 2019 (Amir et al.; Sheeba & Krishnan) respectively focused on the infusion of LMSs with automatic recognition of students' learning style, however, versions of Gardner's learning style theory have been widely disputed for more than a decade now (Husmann & O'Loughlin, 2019; Knoll et al., 2017; Kraemer et al., 2009; Rogowsky et al., 2015; Newton & Salvi, 2020). Perhaps it is appealing to deductive minds such as the engineers and programmers who design LMSs that something so diverse and complex as cognitive science can be reduced to four or five learning styles. This is a simple illustration of the complexity involved in developing these systems and the importance of including all stakeholders.

Coates et al., (2005) identifies some key issues with LMS use almost fifteen years ago that are still valid now such as the effect of LMSs on learning and teaching (pedagogically), the unknown effects of LMS use on students' engagement, the new intricacies of changes to teacher skills, labour and ethics introduced by LMS implementation and finally, the possibility for corporatization of education and academic knowledge through widespread LMS use.

2.5.1 Choosing Google Workspace for Education

Since the launch of G-Suite for Education, Google has strived to create and deliver free access to as many services and apps as possible. As of 2019, Android had 124 million users in the US alone out of 299 smartphone million users (Statista, n.d.). Although it was a delayed contestant in the education sector compared with its main rival Microsoft, Google launched its G Suite of various services in 2006, originally known as Google Apps for Education, followed in 2011 by its affordable Chromebook laptops and finally Google Classroom in 2014. This hub for classroom activities now includes a mark book for summative and formative feedback, Facebook-like stream (for teacher-student and student-student interaction), assignments, self-marking quizzes and storage of in-class materials like powerpoints and worksheets within the Google Drive.

As Google's products are mostly free (with the exception to a few upgraded education products), it is possible that Google's edtech has bypassed more

stringent implementation processes to their non-gratis competitors (particularly during the COVID-19 pandemic), and become the leading supplier of LMS technology and support services globally. In addition to this, its hardware, Chromebooks, are used by over 30 million students and educators worldwide (and this has probably increased since the time of writing), while GwE has reached 80 million. Overall, the fiscal value of the entire edtech online market has exploded during the pandemic (Lam, 2020). The android app of classroom includes the capability for incorporation with other third-party apps, allowing subscribing schools access to a vast spectrum of interconnected apps and third parties through the commonplace 'sign in with your Google account' option.

2.5.2 Privacy and democratic issues outside of Google for Education

Google as a company inhibits other potential undemocratic powers which dwell inside a larger context of society, which for educational leaders undoubtedly must play a key role in the implementation decision making process. For instance, in 2016, Google did not properly inform Australian users of a change to combine personal information in Google accounts with browsing data on non-Google websites, which the chairman of the Australian Competition and Consumer Commission (ACCC) stated "...was worth a lot of money to Google" (Nainan, 2020). From 2007 to 2010, Google street cars intentionally accessed millions of unsecured Wi-Fi networks and harvested passwords, emails, photos and other data. Not only did this incident incur hefty fines but Google was also fined in multiple countries for lying to investigators and obstructing investigations (Burdon & McKillop, 2014). In 2015, through its DeepMind initiative, Google obtained millions U.K. NHS (National Health Service) patients' personal data through an illegal agreement with Royal Free Trust hospital in London (Hern, 2017). In 2019, Google LLC and its subsidiary YouTube paid \$170 million to settle with the US Federal Trade Commission and the New York Attorney General regarding claims that YouTube had violated the Children's Online Privacy Protection Act (COPPA) by illegally collecting personal information from children without parental consent. (Federal Trade Commission, 2019). In December 2019, a new lawsuit argued that Google and other tech companies assisted and abetted the UK mining company Glencore who profited from children who were forced to work in dangerous mining conditions in the Congo, conditions which led to injury and death. More worryingly, Google had

“specific knowledge” that the cobalt used in their products was linked to child labour performed in hazardous conditions (Kelly, 2019).

Perrotta et al. (2020) argues that platformisation, particularly on GWfE, diffuses pedagogic practice and restricts the participation of all stakeholders in deciding where data is stored and which third party apps are to be used as these choices are often given to system administrators. Additionally, in 2018 it was revealed that Google tracked users’ locations through apps even when the user had turned location services off (Nakashima, 2018). Google has also been criticised for providing funding to academics and policy makers since 2009 between \$5,000 and \$400,000 to write and publish papers that support Google’s aims in matters “supporting business practices that face regulatory scrutiny” etc. (Nicas, 2017). Some authors of these papers did not declare Google as a funding source. Google’s reach in silencing its critics has also been noted. In a New York Times report (Vogel, 2017) the dismissal of Barry Lynn (a leader of a think tank and advocate of open and fair digital markets) was linked to commendation by Mr Lynn's Open Markets group of the European Commission's verdict to fine Google \$2.8bn in June 2017 for misusing its market dominance. It is notable that New America Foundation (the parent organisation of Mr Lynn’s think tank) is part funded by Alphabet, Google’s parent company. Google has also been fined by EU antitrust regulators for illegally attempting to monopolise the market by preferring its own shopping service in search results (Reuters, 2017). Lastly, with other edtech tools being found to collect vast amounts of ‘necessary’ metadata for example with proctoring software (Koops, 2020), one must question how much of this behavioural surplus data GWfE is collecting, what is it doing with it and where it is going (Zuboff, 2019; Lupton & Williamson, 2017).

In February 2020, New Mexico’s attorney general sued Google, stating they had used educational products to spy on the state’s children and families. Google is said to have collected students’ physical locations, websites they had visited, YouTube videos they had watched and voice recordings. The lawsuit mentions Google even deceived schools, parents, teachers, and students by informing them that there were no privacy concerns with its education products when all the while Google had been harvesting potentially sensitive details on students’ online activities and locations. One major issue of this case was that Google applies different privacy policies on different products, confusing users, and

administrators. For example, if students log into their Chromebooks, a feature is activated that syncs Chrome browser with other devices used by a student on that account. It essentially combines a student's school and out of school web activities into a single digital profile that Google can access (Singer & Wakabayashi, 2020). This claim is further justified by the weak language used by GWfE in their Terms of Service document "We may combine personal information [device information, phone numbers, log information, GPS, IP address, cookies etc.] from one service with information, including personal information, from other Google services" (Google Workspace for Education, n.d.)

In December, the EU moved to investigate tech firms, with an antitrust probe (Chee, 2020) which attempts to reign in the unfair power balance that the troves of data and platforms provide the companies with. The EU also expressed frustration at the amount of litigation regarding antitrust cases and privacy cases. The companies dubbed 'gate keepers' will now have to provide details of political advertising and do more pertaining to privacy on their platforms.

In the eyes of any rational person, these are not examples of reasonable, ethical practices. One ought to question how much GWfE cares about children's learning, privacy and in some cases, their wellbeing. Apart from these obviously worryingly recent controversies, Google is a well-known participant in the PRISM surveillance program (Gellman & Poitras, 2013; Greenwald & MacAskill, 2013) who willingly provided US and non-US citizens' data to the US and UK security agencies of which these companies have somewhat and at times vaguely denied (Lardinois, 2013).

It is interesting to contrast these demerits on Google's marksheet with its recent 'Be Internet Awesome' (USA) or 'Be Internet Legends' (UK) campaign, a Google initiative to teach children digital citizenship, to keep their data safe. This initiative focuses on dealing with online trolls, hackers and scammers and conveniently avoids walking children through adjusting privacy tools, cookie choices and ad settings. Taking all of this into consideration, it would be questionable for educational leaders or government to advocate the use of GWfE only based on its merits as an LMS and its fiscal benefits without considering the company's motivations and intent within the edtech market, its

history and most importantly its potential to achieve an unfair power balance in the education sector.

2.6 Data ethics evolution in edtech tools

It is evident that Google has obviously achieved an enormously commanding and influential position within education systems globally, and even more so with the pivot to online education which has positioned itself in connection with millions of teachers and tens of millions of students. During the pivot to online learning throughout 2020, Google initiated the 'Teach from Anywhere' provision (in partnership with UNESCO's Institute for Information Technologies in Education) (Google for Education, n.d.) as a collection of resources and information for students, parents and teachers during the pandemic. The 'Teach from Anywhere' initiative is more of a tutorial and advertisement for Google's education product rather than a well referenced tool for educators looking for grounded virtual teaching advice. Moreover, Google initiated the 'Learn@Home' programme facilitated by YouTube as a resource for parents and guardians home-schooling or supporting their children at home, this promoted content from selected education partners like code.org, Khan Academy, BBC Bitesize, and other Google services. Again to avoid unnecessary pop-ups from Google, users are coerced into creating a Google account, which furthers Google's data extraction regime. The exponential growth of G Suite and the LMS Classroom reawakens existing questions and controversies over Alphabet's data extractive strategy and privacy concerns regarding this. A report of various LMSs used for the pivot to online learning during the Covid-19 pandemic found G Suite for education was the worst in regards to GDPR data protection laws in Europe (Defenddigitalme, 2020; Krutka et al., 2021)

Google does not sell student data accumulated in GWfE (particularly for third party advertising), however, this does enable Alphabet to make use of intimate information for the purposes of 'value-creating product development' and to improve 'user experiences'. Moreover, it can be argued that Google may be using data it collects in G Suite for education in external products to target students in regards to advertising and search results. In this regard, the gratis nature of G Suite for Education could be described as a training ground for

future loyal customers of Google under the cloak of an 'educational revolution' (Williamson & Hogan 2020). Lastly, during the pandemic there were notable worries regarding the safety of children's data being shared on servers outside of the E.U. (Mašek, 2020)

3. METHODOLOGY

The aim of this critical, comparative study is to identify inconsistencies and potential conflicts between current teachers' standards/ professional ethics and the use of LMSs based on the professional experiences of educational practitioners. After a thorough literature review and discussing hypotheses, this chapter offers an insight first on the research design behind the methodology adopted in order to answer our three main thesis questions:

1. *To what extent are teachers' professional ethics and competencies considered before and during the implementation of Google Workspace for Education in secondary schools in England and the Czech Republic?*
2. *To what extent are teachers' ethics and competencies impacted by the implementation of Google Workspace for Education in secondary schools in England and the Czech Republic?*
3. *To what extent do school leaders consider data safeguarding of stakeholders when implementing Google Workspace for Education in England and the Czech Republic?*

Secondly it also offers an appreciation of the research methods selected to collect and process the data for that purpose.

Given the opportunity which the researchers' current situation provides, research within a practical setting allows the researchers' to easily gain access to participants, documentation and permissions. As the research objective is to acquire an understanding of whether or not LMS adoption & use in schools conflicts with the required and teacher-perceived ethical standards expected of teachers, it is difficult to quantify such measurements within the defined variables.

3.1 Research Design

This research intended to incorporate an explanatory sequential mixed methods approach (Creswell, 2014, p. 234) based on qualitative and quantitative research in order to better understand the research issue (Tashakkori and Teddlie 2003; Creswell, 2005). The researchers rationalised that the utilisation of only one paradigm would not be sufficient to answer the main and subsequent questions, whereas when combined, they complemented and provided each other with essence and allowed thorough analysis (Green et al

1989; Miles and Huberman 1994; Tashakkori and Teddlie 1998). As a result, in the first instance, a qualitative research based on semi-structured interviews was conducted in order to answer questions on the actual aspects considered prior to the implementation with different actors in the leadership team of two English schools and two Czech schools. Sequentially, these interviews aided in the production of a more effective quantitative 24-question Likert survey (Likert, 1932). The chosen methodology enabled the definition of the phenomena and justified the method used (Cohen et al., 2018, p.186).



Figure 3.1a Phases of the thesis methodology

Phase 1 included a review of the most recently published guiding, authoritative, governmental and regulatory literature regarding teaching standards in the Czech Republic and England, consisting of GWfE privacy policies, governmental guidance and previous teaching standard analysis (Call, 2018) as well as the theoretical background in order to create themes and hypotheses to correspond with mutual teaching standards common to participants in their respective countries.

Figure 3.1.b. Set of themes and hypotheses developed from theoretical framework and review of literature.

Theme	Hypothesis
Autonomy	<ul style="list-style-type: none"> ● Due to financing issues in public schools, this may encourage the adoption of cheap/free edtech to facilitate/improve learning. ● Some stakeholder voice is excluded from the decision making in regards to GWfE implementation.
Accountability	<ul style="list-style-type: none"> ● Google's privacy policies are vetted by leadership before implementation and cross referenced with relevant local data safeguarding procedure and leaders keep up to date with developments in regards to this. ● GWfE was implemented as it is seen as one of the most well known, easy to use and efficient LMS available on the edtech market. ● Educational leaders may not fully consider future implications of the sharing of student data with private companies or believe that the benefits outweigh the risks. ● There is a dilemma between the overall efficacy and benefits of Google Workspace for Education versus it's potential risks and downfalls. ● Teachers will feel that they are more accountable in regards to data safeguarding.
Teacher Ethics and Competencies	<ul style="list-style-type: none"> ● The COVID-19 pandemic exponentially increased the use of Google Workspace of Education in various ways in most secondary schools using it. ● Teachers may feel a shift or possible contradictions in their competencies and professional ethics in using private edtech in their classrooms in regards to data collection and privacy. ● Teachers are expected to be knowledgeable and understand the technology they utilize and promote in their lessons without the necessary continued professional development to support this. ● Teachers want more professional development in the use of LMSs
Data Safeguarding	<ul style="list-style-type: none"> ● School leaders are generally unaware of how much student data is passing through GWfE and where this data is being stored. ● Prior to the implementation of GWfE, educational leadership have considered modifications or

	<p>additions to existing policies or the creation of entirely new policies in regards to safeguarding, data protection and appropriate use.</p> <ul style="list-style-type: none"> • Educational professionals generally trust Google and are not aware of any of the company's unethical data practices or legal cases.
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These themes and hypotheses were then used as a basis for constructing interview questions and the drafting of survey questions. However, it is important to state that bracketing and reflexivity (Ahern, 1999) were taken into considerations as the researchers are both educational practitioners using Google Classroom at the time of the data collection therefore this stage was conducted to identify any limitations and/or biases to ensure reflexivity was maintained throughout the study (May & Perry, 2014).

Besides, using non-probability sampling and purposeful sampling, interview participants were identified who met the criteria for data collection (i.e. practices education in a post-primary school and uses Google for Education etc.) and to identify those who would have the expertise knowledge and experience of administering or implementing Google Workspace for Education (Palinkas et al., 2015). A pilot group was created in order to evaluate the semi-structured interview questions, to assess the guidance needed for the interviewer and the length of time needed to gain the correct amount of meaningful data.

During phase 2 the focus was on quantitative research. The senior leaders' interviews and the analysis of their answers provided the necessary reflections and foundations for the creation of a Likert survey to analyse teachers' perceptions on the impacts on their professional ethics. The Likert survey was tested on a pilot group and subsequently improved and reduced to 24 questions and distributed. The choice of a purposeful nonprobability sampling was made as it guided the data collection about specific experiences to explore the research question and to develop theories grounded in the actual experiences of participants (Henry, 2009).

Finally in phase 3, all qualitative and quantitative data was collected, analysed and compared to answer the three supplementary thesis questions. Correlations and conclusions were then made.

3.2 Research methods

Within the post/neo-colonial world we now live, a holistic, outside of the context approach is required to educational research in order to fully grasp the various actors, participants and influences which cause variance within the area of inquiry (Chari & Verdery, 2009; Cowen, 1996; Tikly, 2001). Therefore the researchers deem that using solely a quantitative positivistic approach was not appropriate when the area of inquiry involves discourse on questions of ethics, responsibilities and accountability (Wright, 2006, p. 799). As what is sought is insights and reflections on the possible conflicts between educational practice and professional competence thus a more hermeneutic approach (Dilthey, 1924; Gadamer et al, 2004) was adopted in the shape of an explanatory sequential mixed methods (Creswell, 2014, p. 234).

While noting the subjectivity of this approach, one must appreciate its advantages in giving a breadth of understanding of the area in contrast to comparing dualling variables. In order to offset this, the researchers employed equally dualling qualitative and quantitative techniques to support the themes identified through the analysis. Qualitative content analysis was adopted as a methodology as it enables the methodical and systematic description of the meaning of qualitative data (Mayring, 2000; Schreier, 2012) which can be done following the collection of data from interviews, literature or numerous other sources. Schreier outlines three key features of this method; reduction of data, systematic and flexible (Schreier, 2014, p.170). The choice to apply quantitative research as a follow up from the semi-structured interviews was to corroborate the findings (Stainback & Stainback,1988), to develop further hypotheses as well as to explore other impacts perceived by educators as the platform's primary users. By surveying primary users of GWfE, the project aims to also specifically gauge frontline educators' perceptions of the impact of this LMS on their professional ethics.

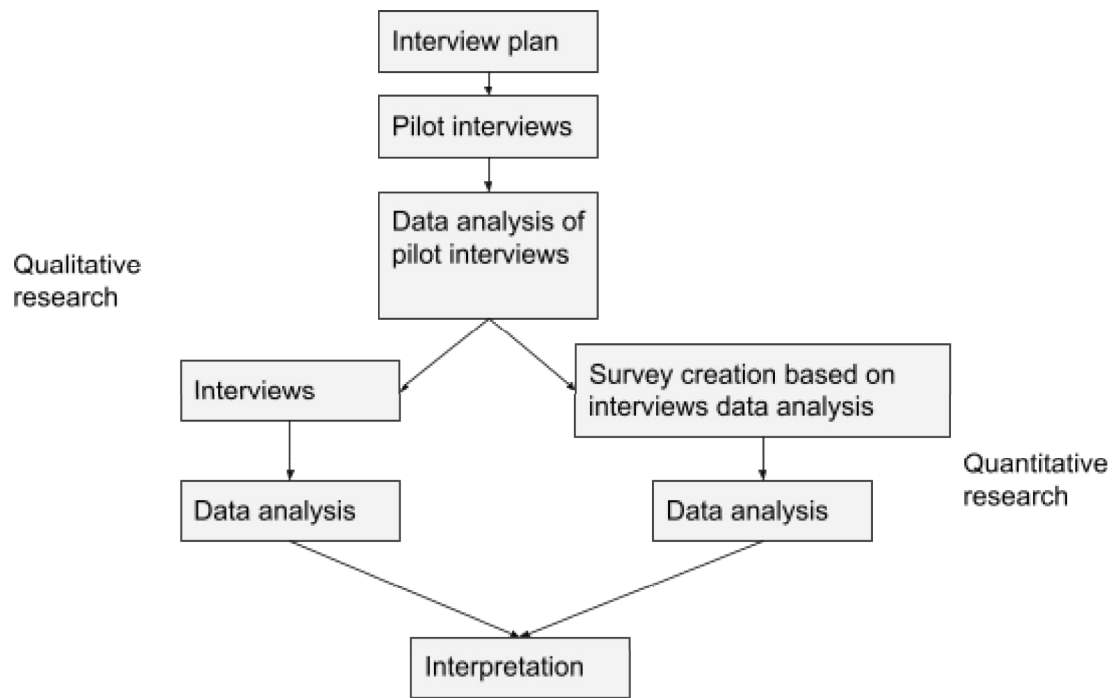


Figure 3.2 the mixed methods design

3.2.1 Sample pool

a) Qualitative

In total, 7 educational leaders were invited to participate in interviews consisting of school senior/middle leadership (principals/vice-principals/heads of department) and data protection officers. Five of the invitees responded and took part in an interview. These participants at the time of interviewing were employed at 4 different public and private secondary schools in the Czech Republic and England and one was employed in a supervisory role overlooking multiple secondary schools. All of the participant schools used GWfE before and during the interview process. All of the participants had worked at the school for more than two years and had either played a role in administering, implementing or managing the GWfE system. This purposeful sampling method was used to ensure the participants not only represented a range of contexts within an international perspective but also in terms of level of experience, leadership and function in the use of Google Workspace for Education. All interviews were conducted using Google Meets and the Tactiq extension for Google Meets was used for transcription purposes.

b) Quantitative

In regards to quantitative research, the convenience sampling technique was used to select the sample pool for the survey from the four schools stated above. Educators' participation in the study was on a voluntary basis and by choosing to take part, informed consent was granted. Participants were informed on the aims of the survey by emails sent with the survey attached but also by a brief attached at the start of the survey. Participants were able to withdraw consent and/or to ask questions at any time to the researchers either face to face or via email as emails of all researchers were provided. Target respondents of the survey are all educators working in secondary schools in England or in the Czech Republic and users of GWfE. In order to ensure statistical significance, it is necessary to have a sample with a big enough size. In this study a minimum sample of 30 for the relational statistical analysis was attempted according to the recommendation by Borg and Gall (1979) and Cohen, Manion & Morrison (2018, p. 93). Overall a sample of n=73 was collected of 6 persons in assisting positions (like librarian, learning support assistant or languages assistants), 27 teachers, 18 teachers with responsibilities, 12 middle leaders and 6 senior leaders. Of these, 48 were females, 22 males and 3 unspecified. Furthermore out of the 73 respondents who took the survey, 4 were in the age range of 20-25 and considered full digital natives (Prensky, 2004), 42 were in the 26-40 categorie and would be seen as semi digital natives/semi digital immigrants, 22 were between 41-56 and would be labelled as full digital immigrants (Prensky, 2004), just like the 5 aged 57+. Finally each participant self-assessed their knowledge of digital literacy by choosing the appropriate statement seen below:

- I fully understand the seven domains of digital literacy described above.
- I somewhat understand the seven domains of digital literacy described above but I have a stronger understanding of some domains more than other domains
- I somewhat understand what is being referred as digital literacy but I have limited knowledge of each domain
- I do not really understand what is being referred to as digital literacy and I would like to know more

As a result 73 people can be considered low for a survey sent to four schools, however the targeted population in this study suffers from survey fatigue as well

as different and more demanding working conditions due to the current pandemic. At the time of the survey, April to May 2021, England was back in school after three months in lockdown, while the Czech Republic was still in lockdown. Besides, this survey was designed to balance out the findings of the qualitative research as such a sample pool of 73 people was more than sufficient for this exercise.

3.2.2 Data methods

a) Qualitative research: semi structured interviews.

Qualitative research is best used to better understand society (Kvale, 1996) and especially people's opinions and experiences (Willig, 2008). As the premise of the interview data collection is inductive based on the theoretical framework, it is necessary for the interviews to be free-flowing and open-ended in order to gauge whether the proposed research questions above are relevant and valid within the confines of a school setting. Additionally, free flowing conversation can help to uncover other areas of research or trends not previously thought of by the researchers. The use of semi-structured interviews was intended to give both the researchers and interviewees more freedom to pursue contextual information within the confines of the main research questions. The use of this methodology allowed better opportunity for interviewees to explore a topic in depth and allow the interviewer to rephrase questions to explore a new idea which the interviewee might bring up within their context. It also allowed for a deeper understanding of the phenomena as the researcher could ask further questions or clarify certain points. Interview questions were based around the three supplementary research questions. It was intended that the interview be conducted under the premise the exploration of the topic, in which interviewer and interviewee discuss, debate and transform their understanding of the topic within a structured conversation (Wolgemuth and Donohue, 2006).

Interview questions were designed to avoid one or two sentence answers in order to grasp the complexity of the expertise of the interviewee's answers and 'how' and 'to what extent' questions were preferred to 'what', 'when', 'where' questions which may lead to less detailed responses. See appendix 2 for more

detail on the development and administration of the questions. Each interview lasted approximately 45-70 minutes. The interviews were recorded with the participants' permission, transcribed and then anonymised after analysis. The analysed data was then shared with each participant post-analysis to ensure there were no misconceptions or issues in the report.

A field trial was also completed on a frontline educator who has some knowledge of these issues to gain an understanding of the timings and understandability of the interview questions and to prevent compounded questions. The interview was conducted by one of the researchers and observed by the other. A debriefing section was then held afterwards to share main themes and to also identify points to improve for all other interviews. The result and content of the trial interview was deemed as valuable and was also included in the main data set.

Before the other interviews were conducted, the themes and premise of the research topic was communicated with the other participants. Time was allowed between questions for interviewees to elaborate on certain answers and probes were developed to elicit more detail (when needed). The interview process took place as shown in appendix 2 using the systematic framework proposed by Kallio et al. (2016);

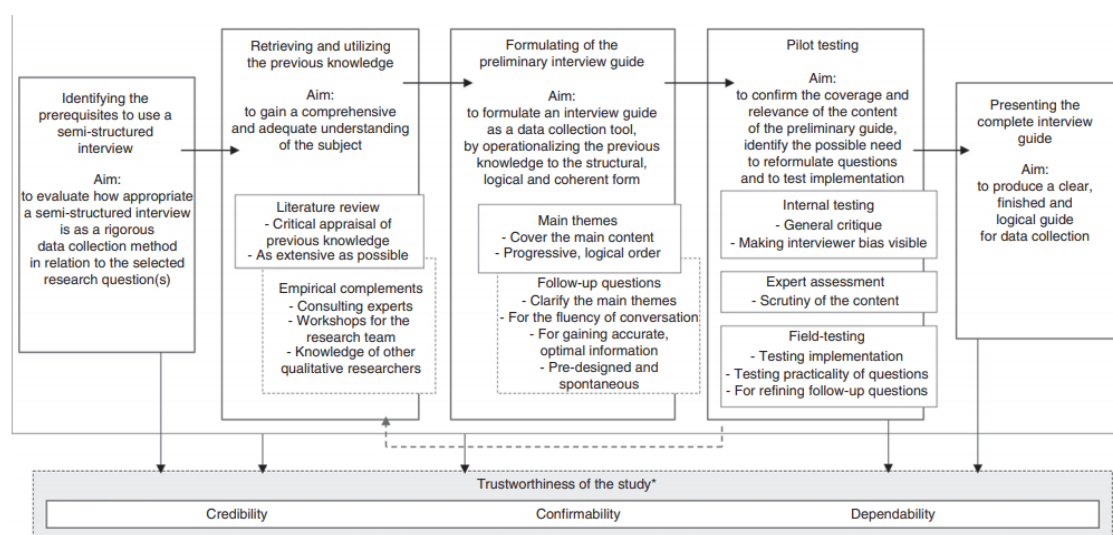


Figure 3.2.2a Framework for the development of qualitative semi-structured interview guide

From this framework, (compounded with the analysis of the field trial), interview questions were identified to match the main themes identified in the theoretical framework;

Autonomy	Platformisation of Education and the Datafication of Schools
Accountability	Implementation of LMSs and Leadership Decisions
Ethics and Competence	Learning During the Pandemic
Data Safeguarding	Professional Ethics and Competencies Relating to LMS use and Data Safeguarding

Fig. 3.2.2b Main themes from theoretical framework used in interviews

b) Quantitative research, online Likert Survey.

Following on from the field trial analysis of the qualitative research, its findings were used to contextualise the quantitative data (Creswell et al, 2003). The choice of an explanatory sequential mixed method meant that for quantitative research, an online survey, created on a Google Form, was the most direct and time saving solution as our sample pool was located in the same schools targeted by the qualitative research. Besides this, Google Forms provided full anonymity, which was a non-negligible element due to the nature of some questions on the survey. As a result, the medium language of the questionnaire was English, as the participating Czech schools use English as their main teaching language, therefore all participants had a good command of English.

The questionnaire (appendix 3) was designed in two sections. The first collected general information, which consisted of gender, age, country of residence, organisational role, years of experience and a self-assessment of digital literacy level. The second section was the main questionnaire which contained 16 questions based on a five-point Likert scale and 5 further

development statements. This survey design was based and divided into three subsections. Subsection 1 covered five questions and further development statements on educators's behaviour, especially while using the LMS. The second section had five questions and a further development statement, which sought to outline the attitudes of educators using the LMS. Finally section 3 consisted of 5 questions and further development statements, which sought to outline educators' knowledge of GWfE.

The choice of a Likert scale-based survey is justified not only due to the fact that it is recognisable and less time-constraining but also due to its standardised ordinal psychometric measurement of attitudes, beliefs and opinions (LaMarca, 2011), which is ideal in regards to this study on teachers's perceptions. Furthermore, it facilitates the administration and analysis of the respondents' answers as they are turned into a single number, which in turn can be used in statistical analysis. Some responses for questions 12, 17, 21 & 22 necessitated further explanations, which could be provided in the form of comments under these.

3.2.3 Ethical considerations

As mixed methods were being applied, methodological issues such as the importance given to each data collection as well as their collection order, had to be considered (Ivankova et al, 2006). The main ethical issue identified during the course of the research was the fact that the two researchers are also teachers working in two of the schools partaking in the study. During data collection, the researchers did not express viewpoints during the interviews with known respondents or influence the answers to questions in the survey directly. Concerns regarding respect for privacy, establishment of honest and open interactions, and avoiding misrepresentations (Sanjari et al, 2014), were resolved by offering anonymity and transparency to interviewees and survey respondents regarding the transcriptions, record of response and a right to examine the thesis before any publication.

3.3 Data Analysis

3.3.1 Measurements scales and coding

Qualitative

The qualitative data from the interviews was used in tandem with the main themes identified from the theoretical framework to explore the relationships and contradictions found between the literature and the experiences of frontline teachers and educational leaders. Field notes were kept during the interview process to enable accurate coding during the analysis process. Coding enabled common relationships and trends to be identified between the four participating schools and for international differences to also be identified. Valuable quotes which gave the essence of the context were from time to time used in the discussion to give a depth of understanding within the context. The researchers found that quite a lot of the data collected during the interview was irrelevant as the interviewer attempted to guide the participants back to discussing the topic in question, therefore a lot of this data was omitted from the coding. Manual coding was carried out using the Atlas.ti qualitative analysis software. Over 150 codes were created according to the relevant discourse in the transcripts and then added alongside the text. This allowed the creation of 10 code groups to compile the numerous codes to aid the identification of related themes and relationships. The codes were completed once by the first researcher and then reviewed and modified by the second researcher using the field notes as an aid. In the results section, both researchers agreed to select the most applicable in vivo codes to exemplify how each theme was identified in the analysis.

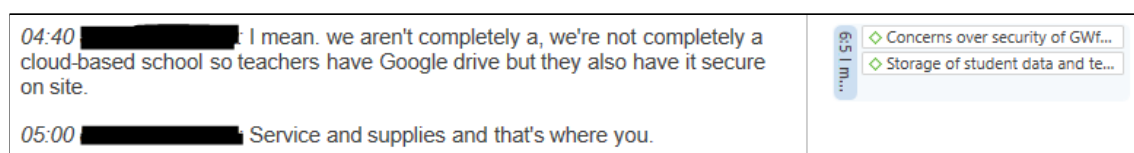


Fig. 3.3.1 Screenshot from Atlas.ti of coding process on transcripts

Quantitative

The survey was divided into two clear sections and more than one statistical method, which is allowed when researching (Allen, Dorozenko, & Roberts, 2016) were applied such means, standard deviation and percentages as well as

Spearman's correlation coefficient (1904) were used. Descriptive statistics were used to answer Research Questions 1–8 (appendix 4); while Research Questions 9–24 used means and standard deviation (appendix 5) as well as IBM SPSS and Spearman rank order coefficient (appendix 6).

The quantitative research was done through a 5 point Likert scale survey, with its answers turned into numerical code. During analysis, SPSS software was used and data analysed using the 0.05 significance level. Descriptive statistics such as percentage counts, standard deviation and means as well as correlational statistics (Spearman test) were used to determine any significant difference and similarities among the age, gender, role, country of residence and digital literacy of respondents and their perception of the impact of a LMS adoption. The mean score (MS) ranges from 0.01 to 1.00 as strongly disagree, then from 1.01 to 2.00 for disagree; followed by 2.01 until 3.00 as neutral, neither agree nor disagree; 3.01 until 4.00 is for agree and the mean score from 4.01 until 5.00 is representative of strongly agree. Correlation, being a statistical test to determine the relationship of two sets of data (Creswell, 2012; Islahuzzaman, 2014), would be interesting to use as the survey not only evaluates educator's behaviour and attitudes but also knowledge. Therefore Spearman's coefficient would identify the increase or decrease of respondents' perceptions on the LMS integrations on their professional ethics.

4. RESULTS

This chapter shows the findings of the study and is divided into three main sections. The first part is evaluating the results from qualitative research, while the second section analyses the results from the quantitative research and finally the third section combines the results from the two methods.

4.1 Qualitative research

Each main theme will now be taken according to the main research questions to provide evidence how these findings were established and justified. In the concluding summary of 4.1 it has been attempted to draw relationships between the main themes in order to gain an overall and holistic understanding of how each main relates to the other.

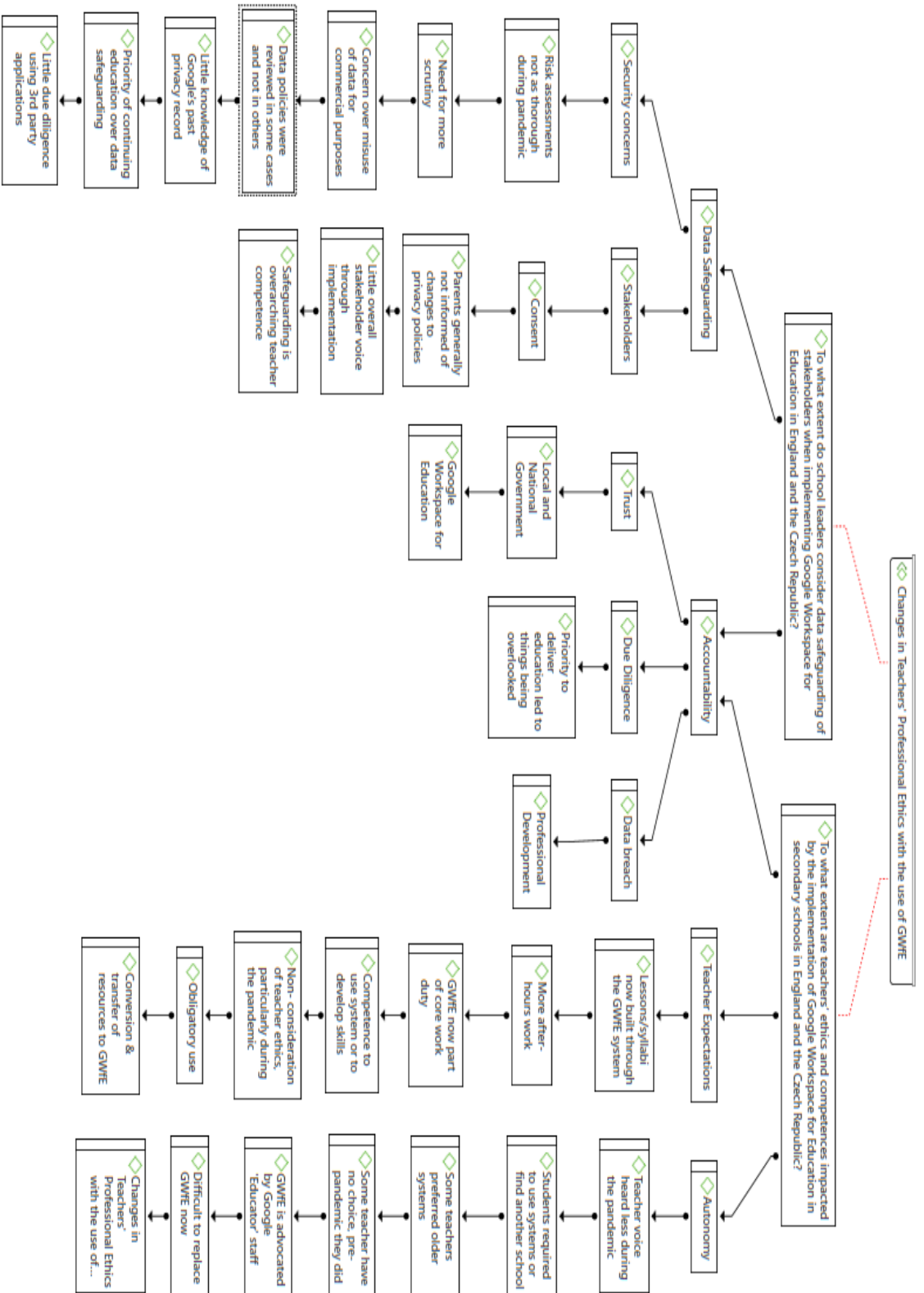


Figure 4.1 Thematic Diagram showing the relationships found throughout qualitative analysis

To what extent do school leaders consider data safeguarding of stakeholders when implementing GWfE in England and the Czech Republic?

All interviewees agreed that using G Suite for education and GWfE was of benefit to their teaching experience and brought many advantages particularly in the pivot to distance learning during the COVID-19 pandemic. Many participants also expressed that GWfE was superior to previous systems used within institutions. Initial findings from the interviews indicated that in the majority of cases, holistic stakeholder voice was not considered before the implementation process of GWfE. In fact, in the majority of cases, the decision to implement mostly resided within senior leadership teams, trusts or edtech companies (Goodrum, 2016). In one instance, there was a pilot within a class but students and parents did not give feedback, only the educators involved in the pilot reported to SLT (senior leadership team). In the following responses, a solid black line indicates a different participant speaking;

The decision was made because we needed an email system and we chose the best system that was available. There was no let's have a vote, what shall we use? Microsoft shall we use Google?

If I'm honest at the time. So when my colleague came back and was buzzing about it and we didn't, we didn't go out and speak to parents or students or Governors or any other stakeholders about what we were doing. So, so, no, we didn't go. We were bad in terms of developing our strategy and think go to any stakeholders

Interviewer: And was there like a student Voice or a stakeholder voice taken into consideration before the implementation?

Interviewee: I'm not aware of that at all, if there was if there was that now I'm not aware of that

Implementation seemed to be driven mostly by a need for an efficient, low cost system and this was often catalyzed by Google-trained staff or Google employees as one interviewee described;

She's now a Google...I want to say innovator as being the top level. So, she became a sort of [Google] educator. I'd have to look at her email to see her badges because she puts all the badges in the signature of her email. And she was just taken with the whole thing and it was really on her enthusiasm that we thought, okay, this looks good.

One interviewee mentioned that GWfE implementation had been driven by a change of email systems and another mentioned it would be paperless however the fact that cloud-based systems are actually less environmentally friendly is still contended (Balasooriya et al., 2016; NRDC Research, n.d.). Specifically regarding further implementation during the pandemic, some participants mentioned the limited choice of LMSs, particularly in England;

We had to, we had to make a decision. The two options were Microsoft or Google offers, and the Google offer was better. It was free. And It was a business level service.

One participant mentioned a need for the entirety of school data to be centralised due to GDPR (Ambrose 2015; Beer 2016, Williamson, 2019);

And there were lots of different places that data was being stored. And so when the gdpr rules changed, the school wanted to move toward saying, this needs to be in one place.

In terms of consequential effects of implementation before and during the pandemic, interviewees commented a lot on how resources and school data/files/resources became increasingly transferred to Google drive and how files and resources increasingly became converted into Google based files;

I'd say, in the last month where every folder that would have been on the Internet is now on Google Drive.

We've changed all our personal files from the server to be based on the cloud, Google drive.

Now we are uploading work in that format. They've [students] just realized that it's easier to attach a Google doc, than it is to go do something in a different program and then save it and, and do things like that....it is rare for something to not be on a G Suite product in school.

Some participants noted that staff in their institutions were in the process or had already transferred teaching resources, syllabi or entire courses previously held on solid-state storage or on other school systems onto Google Drive and in 2 out of 5 interviews it was mentioned how the curriculum had increasingly become based on GWfE;

So, all of our curriculums are on drive. It has been entirely written by members of staff. This is how we set up our learning beforehand, every lesson has its resources. And every child now has that posted to them after every lesson. They have two curriculums, they've got the curriculum they experience in class and now they have the supported curriculum that is posted for every lesson on Google Classroom.

Many of the school leaders mentioned that most of the important records (SEN, medical, behavioural and other personal details) are still kept on school servers or on paper documents which hints at a certain level of distrust for the security on the cloud.

So the main records are on site and backed up as well, not backed up to the cloud, but educators can use both and there is no distinction as to what they're not told to use. So that's not determined by the school. So that has an implication, it's also easier to share resources at home. So particularly for me, I find Google Drive better...the fact you can get them at home.

Questions about continued professional development (CPD) were important to understand the leaders' knowledge of how GWfE is applied and used within schools. Interview questions regarding this issue were directed to gauge an

understanding of how well prepared and how well trained staff are to utilise LMSs. Interestingly, most of the interviewees mentioned some form of training or sharing good practice that staff took part in and one school had hosted a session for parents.

So every year, there would be at least two training sessions, where you could go and learn something new about it or get more confident with it. So the head of computing would always look after the beginners and the Google Certified educator innovator

We started the Google Guardian feature so that the parents could see what was going on in the Google classrooms. So we did like a video training session for parents

In 4 out of 5 interviews some form of professional development existed either during the implementation process annually or continually to educate and inform staff on how to utilise the system more efficiently and safely although in some cases participants expressed this was a little superficial in some cases. Two interviewees mentioned that their CPD sessions on the use of GWfE had been organised or carried out by Google or educators with direct links to the company.

Interviewer: You do it [CPD] through Google?

Interviewee: Yeah, they've been very good to us. And they've given some great opportunities to our Computing department...And yeah, it's just been, you know, it's been a really sort of positive partnership but you know, we've utilized them and we've gone through the kind of Google. Way of doing it in the Google training of doing it and it's always been really positive for us. So I think we continue doing that.

4 out of 5 of the participants commented on some inadequacy of training for staff and especially about knowledge and understanding on data safeguarding.

Yeah, it does feel like the training we did at the beginning of the year, safeguarding kids online and ourselves online just isn't enough for the

amount of online time we have and the amount and the use, we've been giving these programs.

Where we train staff up a little bit more about what Google Workspace means for safeguarding and data protection, we could all probably use a refresher because like I said, just now I think we've been very distracted due to pandemic issues, but at the same time, we've needed to use it way more. So we sort of gone from like casually using it to really using it, but not probably being prepared because of the nature of what was going on around us. I do feel that it's necessary in our school. Probably to train, or at least increase awareness and training.

Regarding questions on data safeguarding and privacy (Bode & Kristensen, 2016; Williamson, 2020c), participants were a little more fragmented. While most interviewees outlined a resounding trust in GWfE to protect their data, there were a spectrum of answers in regards to different issues that had been dealt with in very different ways. Some participants were incredibly thorough in their approach to the use of GWfE and its additional features.

And I'm looking for what data they're collecting. So basically, I don't want you to collect any data on the students, so that means no personal data on students. I'm also looking about where they're keeping the data. How long they're keeping it. So they know that there's a deletion of this data, how they're using it, where they're selling it. So I go through those, I'm going through the criteria from the GDPR regulations.

In terms of a risk assessment or SWOT analysis of GWfE during or before implementation, all interviewees except one (quoted above) avoided answering the question directly. Almost all participants agreed that some alterations or improvements needed to be made following the pandemic as it had accelerated the unchecked use of edtech in their schools.

It's even more blurred now that we're online together all the time and you're seeing into people's houses and you're getting so much more personal information about them. That I am even just talking about it

now, if the pandemic goes on much longer, we might need to even adapt our policy because I don't, I don't even know where we stand on things.

[During pandemic] Teaching and learning is the most important thing. And so we didn't give data sharing or things like that due care and attention. We just didn't because we had to get the school online. In terms of going forward. I hope that Google is going to use that data ethically. But it is only a hope, I don't know. I don't know.

One interviewee admitted that nothing had been carried out and most other participants referred to another policy or something else not related to the question.

No. The only thing that came down from our trust was it said, make sure that students have read a code of conduct and for using the G suite and for behavior and lessons. And now, to the best of my knowledge, nope, no risk assessment.

I don't know. I don't know the ins and outs of the policies. Even my own daughter goes to school, so I'm wondering. And now everyone is using it as their school account. So I don't know what the policies are. Once again, I I don't particularly know. I should actually check my daughter's contract and stuff. I don't know.

Other themes that were identified surrounding data safeguarding in the participants' schools were that of the skills and knowledge expected of educators and the actual level of competence to identify or prevent data safeguarding issues.

Interviewer: Do you think the educators have Knowledge skills and understanding to sort of limit the amount of student data being put out into the internet.

Interviewee: No, I don't. I do, I don't think they do at all. I think the assumption is that, well, that that's the platforms taking care of that. Or I

think the assumption is, Will can't Academy their reputable. So they're taking care of that. And as a teacher, I don't have to worry about that. I just need to get on with the teaching and so, it will be resounding. No, no, I don't think educators, think about it.

The participants also commented on their concerns over the management of data collected by GWfE, one participant outlined their process of gaining information from GWfE on this issue;

We have to go through a process when we were constantly asking Google about Google and being able to delete things and to what extent we could and what does that extent mean? It would stay in Google forever. So, Are we in a different position? No, because we're essentially trusting someone to do something with that Digital Data. So that was one of our biggest issues, with Google and Google Vault. We had a big going backwards and forwards with Google about Google and things being deleted from Google Vault and being there forever. So deleting accounts and then where that information is going to be accessible from, we have worked a lot through that and to the extent that we can be as an individual school.

Additionally, there were many gray areas surrounding the access that students could gain to certain apps and accounts while being under the age of 13, for example using their personal email address or parents' email address.

So they've signed up. They've got their parents' email address so that's safeguarding, everything's fine and I don't think, I think about it all. I wouldn't think about it as a teacher. And now, I have thought about it for the last hour quite scared.

In instances when policy was absent other forms of consent or parental consent did exist to allow for the use of the system within the school but this was mainly in compliance with GDPR.

Interviewer: Do you think they [parents] were aware of the contents?

Interviewee: No, I'd say they most probably weren't. I think it would be, it would be one of those things where now, when our students join in year

seven parents will, they'll get they'll give permissions for certain things, so they say you have permission to photograph my child. You can use that online or you can use that only within school, or you can blah and and I honestly think it is just a box. That parents take, you know, read this and say that you agree to the privacy policy

One of the more worrying trends noted, particularly in the participants from England, was the access to education for those students or parents who wished to not use GWfE out of choice if they so wanted. This echoes how Biesta (2014) envisioned the de-individualisation of learners as schools move towards centralisation and standardisation. The four quotes below are from four different interviewees;

I do not think it is possible to be in a mainstream state-funded education system without using it [GWfE]

If you don't want to use Google, it's almost like "don't come to our school".

But I I believe the school can deny admission to somebody who's, where it's going to greatly affect their learning at the school.

I mean they have, their parents have the right to do that. The school also has the right to deny them admission if their GDPR preferences would affect their schooling in such a great way. So that might be a situation where the school would say, go somewhere else.

To what extent are educators' ethics and competencies impacted by the implementation of GWfE in secondary schools in England and the Czech Republic?

Regarding these questions in the interviews most participants responded that the use of GWfE in general did not change teacher ethics/competencies but rather that it had blurred, complicated or transformed these expectations. It was

frequently noted in field memos about how educators had felt a certain restrictiveness imposed (particularly during the pandemic) on their autonomy.

I think. In terms of what I think about the use of data sharing. I think and it's horrible to say it, but I think that we had no choice. I think that certainly for pandemic teaching as a profession, certainly as a school we felt we were backed into a corner. What can we put out there?

Another trend coming out of the teacher autonomy line of investigation was that educators did generally have the option before the pandemic to use or not to use GWfE but the circumstances of the pandemic had now really concreted the use of the LMS into their core work duties (Williamson, 2021; Sandvik and Ik Dahl, 2021; Teräs et al., 2020).

I mean I didn't even use Google Classroom until this year, actually. I know other educators have used it before that, but I do think for a long time it was kind of optional, some educators used the Google workspace, some educators still use the server there, wasn't anybody saying which one needed to be used.

If I had a member of staff that said I don't want to teach like this. I think the next step for me would have been to call them in and say well this is now part of your role. You know, this is part of your role as a teacher. This is part of the Teaching Standards in terms of. So why don't you want to use this platform? This is what you're using.

I don't know that that teacher could carry on, you know, it's part of an integral part of what we're doing. So if they didn't agree to the privacy policy, it may well be that they'd be better served at a school that had a policy that they did agree with. And I know that sounds really harsh, but it has become just such an integral fabric of our teaching and learning.

If a teacher refused to use Google workspace platform. Yeah, I wouldn't want to be that teacher because I don't know, I don't know what you would do, I think. I I guess if they knew that in the interview, they probably wouldn't hire them

One participant gave an example of were a school department actually found another combination of systems more beneficial to their staff and learning however they were required to use GWfE instead;

Some were dragged into it and the maths Department in particular. They already had a lot of platforms and websites that were self-marking for homework and math lessons and things like that. And so then I think they felt that they were being pulled into something.

In terms of how educators' roles changed in terms of their day to day roles and professional ethics, the interviews were useful in painting a picture how this had changed, particularly during the pandemic. 4 out of 5 participants expressed that educators ethics had changed in some way or another;

I guess and when I might assume it applies to lots of different educators is that we may have compromised our ethics a little bit more because a lot of things probably. Pandemic tiredness is a big part of it and just being tired of doing this. And we've kind of gotten complacent and we're all hoping it's going to be done soon.

Before. I don't, I don't think we did really consider it before. I think the sort of ethical considerations didn't really come in until we were teaching live. so I'd probably say that we didn't really consider ethical considerations before we went live.

3 out of 5 participants expressed that there was a great push to continue education during the pandemic and that educators' ethics and competencies may have been overlooked to prioritise continuing the curriculum.

No, we didn't really focus on the ethics of it. I think, at the time, We were in such a 'don't say panic' state. That's the one word. We were feeling like we were in such a race against time that it was almost like, get it up, get it

out there, worry about that later. And having said that out loud, I'm not proud of having said that out loud.

One participant mentioned how teacher workload had increased and that educators were now having their personal privacy invaded a little due to the fact that work was now so accessible from home (Bergen et al., 2015);

So I think I would look at it in terms of students' messaging educators out of hours and how educators would handle that and how educators would kind of ethically respond to the fact that, okay, this is a student that obviously needs my attention. However, this is not in school hours. So I need to kind of make a decision here as to, what's going to be right? What's going to be wrong?

4.1.1 Summary of Qualitative Findings

All interviewees agreed that the COVID-19 pandemic had accelerated and expanded the use of GWfE within their institutions resembling a sudden jump from what Dutton et al. (2004) would describe as a level 1 to a level 6 in terms of the use of LMS systems as almost the entire teaching staff within each school had utilised these systems extensively during this time. The reasons for implementation were quite diverse and in some instances implementation appeared almost incidental as schools had been initially using the Gmail email system and then gradually started to use other parts of the Gsuite and this was catalysed by different members of staff, some of whom had Google-based training or direct links to Google employees. This appeared to increase the rate of the gradual transfer and conversion of documents over to Google drive and to Google formats which was perceived as convenient in other applications of the platform (Google Classroom, assignment submission etc.) including one participant who outlined entire syllabi being transferred to GWfE, however important files were generally still stored on paper or on school servers. GSuite for education also provided a cheaper option and in some cases a free option for a product that the school deemed professional or business level quality and also was also designed for secondary education.

In regards to how staff were prepared for implementation and after, some form of training or continued professional development took place but almost all participants felt inadequately trained and viewed their staff inadequately trained particularly regarding data safeguarding. In regards to the preparation or modifications to existing policy within schools, most interview participants showed little evidence of how policy was prepared or implemented with the exception of one participant. In general, the participants did not carry out risk assessments nor SWOT analysis on GWfE before or after implementation as it was generally believed that there was little need to as Google was compliant with GDPR or that someone else already had at a trust or government level. Overall, interviewees communicated that the COVID-19 pandemic had overall lowered their guard so to speak regarding data safeguarding and in some of the interviews, the interviewees felt a feeling of regret or worry related to that fact.

One of the most surprising findings from the data collection was a trend of exclusion for those who did not wish to use the system, both learners and educators. The defining reason seemed to be the belief that the LMS was now integral to the institution and that any reluctance to use it would severely diminish the daily practicalities of learning and teaching, even if certain subjects preferred the use of other, more efficient systems. Additionally to this, participants communicated that educators' roles had now altered in that there was a greater importance in using GWfE as part of their core responsibilities, which brings with it implications which will be discussed later.

4.2 Quantitative research

The survey questions (appendix 3) were divided into three categories of studies. First of all, the survey would measure educators' behaviour while using the LMS, then it would look into their beliefs and attitudes towards it but also its impact on their professional ethics and finally it would evaluate their knowledge of the LMS but also of its owner. This progression in questioning allowed participants to evaluate not only the edtech tool but also their own conduct whilst using it and their relative knowledge of it.

4.2.1 Notes on sample pool

Regarding the ages of participants, 4 were 20-25 (appendix 4) and considered full digital natives (Prensky, 2004), 42 were 26-40 and considered semi digital natives/semi digital immigrants, 22 were 41-56 and considered full digital immigrants (Prensky, 2004), as are the 5 participants 57+ category. Nevertheless, despite having 52.1% participants considered as digital natives, only 9.6% perceived themselves as fully digitally literate. This information is relevant when observing participants' digital literacy self-assessment responses on the Likert survey as Maderick et al. (2015) would argue that pre-service educators often inaccurately self-assess themselves. Though when a survey is taken in conjunction with other means such as direct questions on their knowledge, behaviour and attitudes towards an edtech tool, it provides them with an opportunity to reassess, which often leads to future opportunity to improve their competence.

4.2.2 Descriptive analysis

Questions 9 to 14 evaluated educators' conduct on the platform. This section was chosen to be first as it is more accommodating for the participants to evaluate their use of the LMS through time and its normal practices or habits. The hypothesis from chapter 3 regarding an increased use of GWfE was proven correct as the results to questions 9 and 10 showed that all participants have unanimously increased LMS use during the pivot to online learning. (Q9 Mean Score (MS)=3.23 vs Q10 MS= 4.56).

The succeeding questions (questions 11-15) examined data safeguarding practices and conduct while using GWfE and its additional services. The phrasing of question 11 is important as it stipulates the facilitating of 'non-core' services, which potentially increase data tracking by third parties. The mean result for this question was 4.01 indicating a strong agreement that educators do indeed facilitate access to third party applications and sites through Google Classroom.

Question 12 results were interesting and demonstrated that most educators were in agreement with the statement that they did not always read the privacy policies of edtech tools prior to promoting them. Furthermore, correlation between age and privacy policy scrutiny was $\rho = -0.233$ (appendix 6.1), which demonstrates a weak negative relationship between the two indicating that being a digital native/immigrant plays no significant factor in due diligence of this nature. This weak correlation also applied to all other educator populations (gender/role/age).

Question 13 gave participants the opportunity to further explain their answer to question 12 and the 3 main reasons for not reading privacy policies were as follows: time constraint, trust in tools vetted by the school or the school trust, trust in tools promoted/vetted by the government or other organisations.

13. If you do not always check the privacy policies for Educational technology tools you use in your lessons, please outline why this is so (you can select multiple options)

73 responses

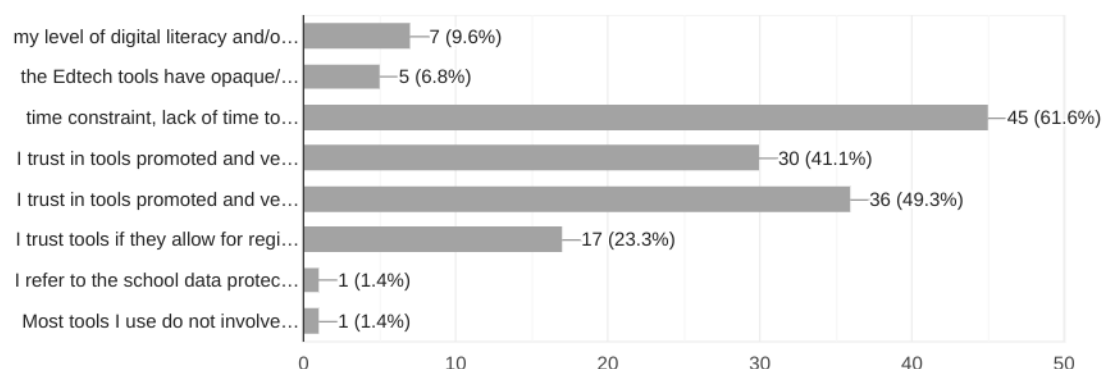


Figure 4.2.2a: Google form results of question 13, reasons for not checking privacy policies of edtech tools.

Finally the last question (question 14) in this section focussed on educators' consultation with the institution/data protection officer regarding edtech implementation. The mean result at 3.03 is at the lower end of agreement to consulting with schools before implementation and it has a standard deviation of 1.24, which signifies that a significant number of educators promote or use edtech without consultation of SLT or a data protection officer or equivalent.

Thus, in this section, which examined educators' behaviours on the platform, the results were as expected in our hypothesis. In line with their digital literacy

self-assessment, the majority of educators indicated that they lack enough time to afford the proper due diligence to vet or consult these platforms with their management. In that, they trust the SLT or government to bear the responsibility of carrying out this function, however, the qualitative results show the contrary. This could be why GWfE's implementation has been more successful through frontline educators than through school leaders as it meant a faster integration that could by-pass the standard school procedures and protocols (Krutka, et al., 2021). One correlation was found between this point and one population, computing educators. The reasons are self-explanatory as they are the ones who have to teach digital literacy in schools to their GCSE students as outlined in chapter one.

The second part of the survey analysis is composed of questions 15 to 19 and deals with the attitudes of the participants, especially their beliefs, towards GWfE's LMS, Google Classroom. Questions 15 and 16 evaluated participant's views on the platform, focusing on data safeguarding. In question 15, the mean score was of 3.79 and in question 16 of 4.79, with very low standard deviations of 0.99 and 0.83 respectively proving that they put their trust in GWfE to safeguard students' data and follow national regulations like the GDPR. However, the ensuing questions being on their opinions of their own use, the standard deviations increased. In question 17, regarding educators' accountability for the safeguarding of students' data through the use of GWfE and additional edtech in their school, the results were mixed with a neutral mean score of 2.9. Though this neutrality is interesting as there is a polarisation in their answers as seen in the graph (Figure 4.2.2B).

Q17. As a teacher, I believe I am ultimately and solely responsible for the safeguarding of students' data through the use of Google Workspace for Education in your school or any other Edtech tools.

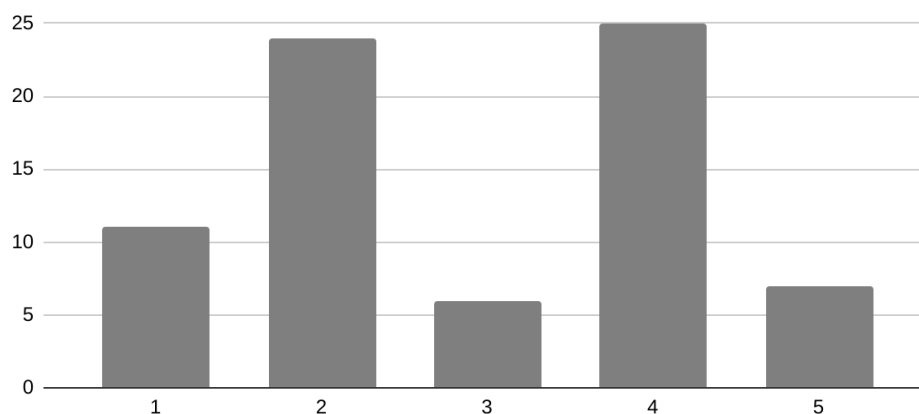


Figure 4.2.2b Graph showing results gained from question 17 of Likert survey

Moreover there is a noticeable weak yet positive relationship of $\rho=0.288$ (appendix 6.2) between questions 14 on educators seeking consent from their school management prior to promoting edtech tools and question 17 on the responsibility they feel regarding data safeguarding. This indicates that those who felt more responsible for the sole safeguarding of students' data whilst using edtech, were more likely to consult the DPO before implementing.

To grasp whom educators believe the responsibility should fall upon, they were asked to identify these actors in question 18. The top three in descending rank order were; data protection officer and Google, then Senior Leadership team and finally everyone from students, parents, educators, senior leaders, board of governors, DPO, government, etc. This agreed with hypotheses set out in chapter 3.

The final question (question 19) in this section examines the matter of getting educators' consent before implementing an LMS. This question creates discussion as the respondents' answers are polarised as the graph below illustrates.

Q19. When private Educational Technology tools like Google Workspace for Education are implemented in schools, I believe my consultation does not need to be sought.

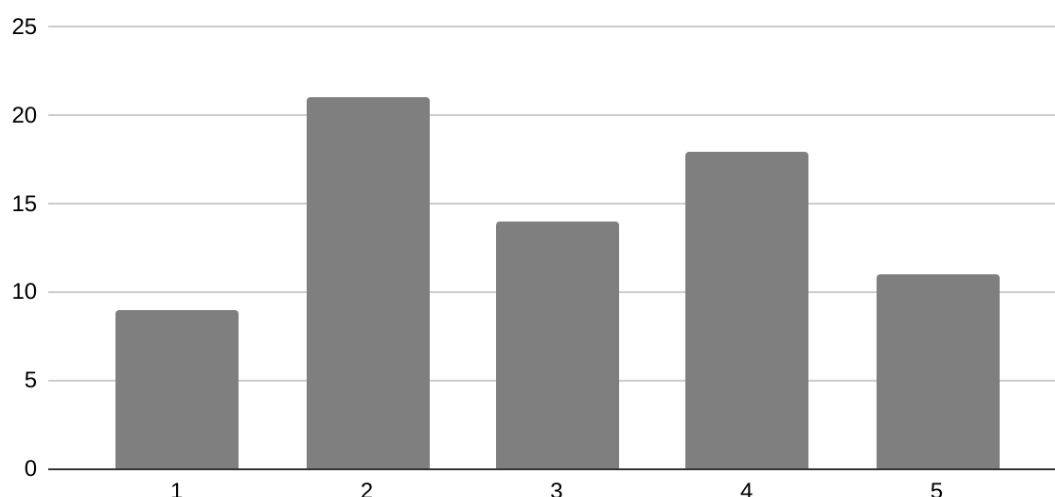


Figure 4.2.3c Results of question 19 on consent.

Within the section on attitudes of educators toward the platform, opinion varies on questions of accountability as educators feel some responsibility for the safeguarding of students' data but do feel that Google as well as the school administration are the ones that should be trusted to ensure that the use of the platform is compliant with data regulation. This is notable as it contradicts results from question 11 and question 12 regarding linking/promoting external edtech tools through Google Classroom to their students and reading privacy policies prior to their use.

The final section of the survey, questions 20-24, evaluated knowledge of the platform performance, its functionalities and their awareness of Google's ethical practices, as well as their assessment of CPD. The first question, question 20, examined the educators' awareness of data collection and tracking of students whilst using the platform. Surprisingly, despite the mean score being 2.96, which would prove neutral, 43.4% of participants did agree and strongly agree to the statement compared with 32.5% who disagreed, which proves that some were aware that students are being tracked through the platform.

In question 21 participants were asked whether their professional ethics had been compromised by using GWfE. There was a noticeable disagreement with the statement (MS=2.12). The following question (21) assessed educators' reasons for the agreement with the previous statement. Half of participants

noted data privacy concerns due to the platform owner being disreputable, the remainder affirmed that the platform had added to their workload and was not fit for the subject they taught, with one stating that “it is a poor tool for maths and changes the format of maths product”.

The following question (22) was designed to assess participants’ knowledge of the ethical reputation of Google and their awareness of any malpractice. The results show that the participants were not quite aware ($MS=2.6$, appendix 5) of any incidents of unethical data practice involving Google apart from 15 participants, who expanded on this in question 22. Their answers ranged from advertisement tracking, attempts to misuse aggregated data, holding data offshore, data breaches and accusations of bias in Google's tools to contentious government contracts. Yet when analysing for a common factor for these 15 individuals, none could be found in the variables set in this study.

Finally question 23 asked educators to assess how adequate and relevant their professional development was to safeguard students’ data in spite of the increased use of new educational technologies in school environments. Despite a mean score of 3.15 (appendix 5), which would see the sample pool neither agreeing nor disagreeing, there is still a noticeable 35.6% ($n=73$) disagreeing with the statement. These results supported negative correlations between participants’ digital literacy and question 22 & 23 with $\rho = -0.470$ (Q22) and $\rho = -0.362$ (Q23) (appendix 6.3), plus the answers from question 24 show that there is a necessity for further professional development on the topic.

4.3 Combined research methods results

Using a blended method of research allowed the researchers to answer our main thesis question, as well as its three subquestions. During the comparison of both results analysis, common variables as well as variations could be found.

4.3.1 Common findings between qualitative and quantitative methods

Overall, four common themes were identified in the qualitative and quantitative research. Firstly, generally all participants agreed that COVID-19 had

accelerated and expanded the use of GWfE in their schools and that this had significantly aided the facilitation of learning during this time. Secondly, consultation/consent with/from all stakeholders seems to have been an afterthought even though in question 19 in the survey, from the educators' perspectives, consent is a polarised issue and answers showed neutral results (MS=3.01). The interviewees generally expressed that students and educators automatically consent to using GWfE and if not, the option to leave and join a different school would be offered. Thirdly, regarding the implementation of GWfE and due diligence regarding data safeguarding, most interviewees' decisions reviewed the economical and practical aspects of the platform but did not critically assess the short-term and long-term impacts on data safeguarding. Only one school did a full analysis and concluded that this LMS was safer than their data safeguarding system at the time. Interestingly both sets of data found that using Google's platform and its cloud was safer for storing data than their previous system. This is possibly based on the assumptions that the LMS is secure and follows GDPR as seen in the correlations stated above in point 4.2.2 that educators perceived the LMS to be mostly GDPR compliant with a correlation of $\rho=0.471$ (appendix 6.4). In regards to educators, the same logic applies. Both question 12 and question 14 came back with neutral results (MS at 3.60 and 3.03 respectively, appendix 5) but with standard deviation of 1.2 for each showing disparities in the educators' relationship to data safeguarding.

The fourth common finding in both methods was on the lack of consideration on the implementation impacts on professional ethics. During the interviews it became clear that only some consideration had been given to how the use of this LMS and its additional tools for teaching and learning would change educators' conduct and expectation. Regardless of the significant workload impact, little training regarding data safeguarding within the LMS had been administered in England and in the Czech Republic, which put their staff in an unknowledgeable position and leading some educators to share and promote possibly unverified edtech tools with their students and potentially putting their data at risk. Additionally, the implementation had put more accountability in the hands of the educators, according to the survey however, most educators perceive the accountability of safeguarding in the hands of DPOs, Google and school leadership.

4.3.2 Variation in qualitative and quantitative findings

One very noticeable variation between both the qualitative and quantitative data is on data safeguarding accountability. While it is clear for the leaders interviewed that the responsibility for this was on educators and their professional conduct, question 22 showed the contrary from the educators perspective, placing Google and the DPO as mainly responsible. 31.5% did answer that everyone was responsible and another 17.8% put themselves as solely responsible. This variation is interesting as a correlation between their feeling of sole responsibility and data tracking increase can be seen in questions 17 & 20 with $\rho=0.301$ (appendix 6.5), which shows a weak positive relationship, demonstrating those who felt more accountability for the data safeguarding of children within GWfE also believed that they had increased the amount of tracking of children through GWfE. Besides, most participants in the interviews were unaware of any unethical practices of Google or its affiliates, however, 20.3% participants in the survey noted some awareness of various unethical data practices (in question 22).

The views expressed in both methods on continuous professional development (CPD) and overall preparedness of educators regarding the use of GWfE were divergent. Some educational leaders in the interviews expressed that staff were sufficiently prepared and trained for a pivot to online learning whereas educators in the survey neither agree nor disagree on the point, whilst overwhelmingly indicating that they would like more CPD on these safeguarding issues. Despite both countries having a digital literacy framework in place as seen in chapter 2, a positive correlation between digital literacy and awareness of unethical data practice incidents linked to Google was observable, demonstrating that the more aware participants were of unethical practices, the more confident they were of their digital literacy knowledge. In England this was represented in a strong positive relationship ($\rho=0.512$) and in the Czech Republic with a moderate positive relationship ($\rho=0.379$) (appendix 6.6), which supports the need more digital literacy training to holistically understand the edtech tools educators utilise.

These differences could be clearly seen when educators indicated in the survey that they mostly facilitate the use of affiliated and non-affiliated apps and unchecked websites through Google Classroom. Additionally most agreed to not reading the privacy policies, mostly due to time constraints. This is in contradiction to the opinions of the senior leaders, who in the interviews, expressed that educators generally do carry out these practices and/or are expected to. One senior leader even indicated that all educators must bring any new edtech sites/apps/tools to her attention before implementation which is in contradiction to the general survey results as in question 14, most participants answered that they do not seek permission before using new edtech.

5. DISCUSSION

This chapter will discuss the results, their implications, the limitations of the study and conclude with recommendations for the future and possible further areas for research. The results allowed the researchers to determine some of the ethical considerations given by senior leaders when implementing GWfE in a secondary school setting, especially regarding the impacts on data safeguarding and teachers' professional ethics. The main research question and supplementary questions have been answered to an extent but overall the researchers feel these answers have created more questions than given any definitive answers, such as;

Leadership	<ul style="list-style-type: none"> ● To what extent has the use of GWfE limited school/stakeholder autonomy? ● What consequences would occur if Google increased prices for their services? ● What consequences would occur if Google changed some of its core and additional services' privacy policies to include new ways of tracking for instance FloCing (Bohn, 2021)? ● What consequences would occur if Google decided to sell their services to a corporation located in a country where data safeguarding laws are non-existent or very limited?
Users	<ul style="list-style-type: none"> ● Are users' learning abilities getting limited and/or radicalised? ● What is the course of actions for teachers refusing to use GWfE on the principle that it breaches their professional ethics? ● What is the course of actions for students and/or their guardians refusing to use GWfE on principle that it breaches their rights? ● What are the potential impacts of transferring school files and resources to Google format? Ownership?
Ethics	<ul style="list-style-type: none"> ● To what extent has the use of GWfE altered ethics for schools and educators? ● To what extent are schools using GWfE participating in surveillance capitalism? ● To what extent are schools using GWfE suppressing the rights of their stakeholders and how does this affect human rights and the principles of democracy? ● To what extent does Google indirectly/directly make profits from this tool?

5.1 Interpretations

It is worth noting that critically applied research on edtech tools deployed within secondary schools, especially privately owned edtech tools like GWfE, are scarce and more research is required. Contrastingly in higher education, more has been written regarding the implementation and impacts of privately owned edtech tools in universities, (Williamson and Hogan, 2020; Lupton and Williamson, 2017; Watters, 2020b; Coates et al., 2005).

The overall findings of the research point to an extensive and accelerated implementation of GWfE. The reasons for implementation ranged from continued delivery of education during the COVID-19 pandemic, to a gradual (almost incidental) implementation stemming from the use of Gmail. These implementations were generally carried out by senior leaders and lacked stakeholder voice, whilst increasing the transfer and conversion of files to Google formats stored within the Google drive and even the transfer of whole syllabi resources to Google Classroom. This occurred both in England and the Czech Republic. In most cases and in both nations, some form of training existed for the use of GWfE however this was not focused on data safeguarding within the system and almost all participants from the quantitative results felt they needed more training. Before and during implementation, little evidence exists that policies or risk assessments were carried out (with the exception of one qualitative participant) and this was generally due to the trust held that GWfE was compliant with data safeguarding laws and regulations. A few participants from both England and the Czech Republic reflected that the COVID-19 pandemic had lowered their guard and somewhat opened the gates to potential edtech threats. The most concerning finding (from the qualitative data) in both countries, particularly England, was the restriction that GWfE had imposed on stakeholders in terms of choice to use the system which raises questions of not only autonomy of learners but also the autonomy and professionalism of educators to be trusted to pick, choose and alter their own systems.

So, how does GWfE impact teachers' professional ethics? The researchers see the following main points as key findings;

- GWfE has been widely implemented without enough due diligence being applied to vetting the LMS in regards to data safeguarding considering its and its parent company's ethical reputation.

This finding goes against some of the hypotheses outlined in chapter 3 (figure 3.1.b). When implementing a privately owned LMS like Google into a school, a full in-depth analysis of the platform should consider all aspects ranging from the obvious teaching and learning advantages/disadvantages, to the actual ethical stance and motives of the platform owners (Selwyn & Heffernan, 2021). The results show that the majority of school leaders and teachers have limited knowledge of the GWfE LMS operating system, data traffic moving through it and also of the unethical practices of the actual corporation that runs it. This was particularly true for participants from the Czech Republic. Decisions to adopt the platform were mainly taken by school leaders for financial and pragmatic reasons, such as practicality, centralised datafication and to facilitate learning (during a pandemic). Only one school had done a full SWOT audit of the platform before implementation and had weighted the impact on data safeguarding.

As also outlined in chapter 1, the researchers feel that Google and its parent Alphabet, lack the necessary reputable trust to be used as an LMS within an educational setting with children under the age of 18. With the so called 'edtech Trojan Horse' (Lossec et al., 2020) being let through the gates of schools during the pandemic, the researchers feel that under pretenses of good-will and free-of-charge use, many edtech companies hold the potential to use and abuse childrens' data in the short and long term, particularly the company in question considering it's list of malpractices in chapter 1.

- The implementation process of GWfE generally did not include all stakeholders.

As noted in chapter one and exemplified by Goodrum (2016), most stakeholder voice was excluded in the implementation. This goes against the recommendations of educational literature regarding the matter (Sliwka & Istance, 2006; Strom et al., 2011) but also within business where it has been noted that the reduction in stakeholder voice can be attributed partly to the increasing power of corporation to control public goods (Edinger-Schons et al.,

2020). In the case of GWfE being implemented, one must be wary about any quieting of stakeholder voices.

- The use of GWfE reduced teacher autonomy by becoming practically compulsory in some schools.

and

- GWfE led to not only a transfer of resources and files to Google Drive but also to conversion of these files to a Google format.

These worrying trends found from the results which were neither hypothesised nor foreseen in the planning stages of the research. The restriction that the implementation of GWfE brings to the teaching profession and teacher autonomy should concern all stakeholders. Particularly with the catalyst of the pandemic, GWfE has cemented itself within educational institutions as an almost necessity compared to 5 years ago when it was seen as somewhat of a learning accessory.

- The impact of data safeguarding accountability on professional ethics is unclear to teachers

Furthermore one of the most puzzling points in the study was on data safeguarding accountability. The interviewed educational leaders perceived that the accountability fell on teachers to follow the procedures or protocols put in place in schools when promoting or using edtech tools with students. For teachers, it is less clear as in the survey they stated that Google and the DPO carry the majority of accountability for GWfE but they also expressed that they do not always follow the procedures put in place mainly due to time constraints. Furthermore, interviewed leaders and surveyed educators expressed that they trust that Google will do the right thing with students' data, while at the same time acknowledging that Google has increased the tracking of student digital behaviours. This ambiguity in the area of accountability potential creates confusion at all levels on what the definition of safeguarding is, how it is applied and who is responsible for it.

- GWfE's impact on teachers' professional ethics globally

This research took place in two different countries, which outlined how

educators felt GWfE impacted on their profession internationally. Despite the unbalanced number of respondents in each country, both research methods came up with agreeing themes. Both countries have a digital literacy framework in place and were deliberately chosen because of this. Participants did show good knowledge of certain aspects of digital literacy, yet the research results showed that leaders and educators had limited knowledge on questions of data safeguarding or unethical behaviours by companies like Google, which means this critical digital literacy section of the framework is not sufficiently taught/promoted. Additionally, it would be interesting to apply similar research to other countries but also with countries that choose to create their own LMS like in French state schools or in Germany to compare and contrast whether the same themes also emerge .

5.2 Implications

5.2.1 Power imbalance

As briefly outlined above, it is concerning that an edtech tool delivered by a company with a record of unethical behaviours is granted access to students' data, especially considering its promotion by governments. These unethical behaviours, as stated in chapter 1 and further outlined by Krutka et al. (2021) range from privacy violations of their employees, their terms of service (ToS) (Schiffer, 2020), gender and racial bias in their search engine (Noble, 2018; Plenke, 2015; Sweeney, 2013; Wakabayashi et al., 2018; Whittaker, 2020), anti-competitive behavior (McCabe et al., 2020; Nadler, 2020; New Mexico v. Google, 2020; Watters, 2019) but also the radicalisation of users through AI use and the promotion of conspiracy theories (Tufekci, 2019).

One factor that will be realised in the coming years due to cuts in educational spending in the U.K. are periods of school austerity which may lead to parents becoming more reliant on supplementary edtech products. This would thusly diminish the importance of school-based, professional, teacher-led education (Selwyn et al., 2020) and solidify the colonisation of big tech within public and private secondary education under the age-old technocentric cloak of 'progress' and 'convenience' when in actual fact it causes more work, restrictive pedagogy, data concerns and ultimately a monetisation of the education sector.

For example, Google understands the power of educators' validation of its tools and has even been caught fraudulently advertising some of its Google Play apps with a "teachers' approved badge" to parents (Paresh, 2021).

Further to this, when considering the immense growth of edtech during and before the pandemic, one should question the motives of the investments. In March 2020 the online tutoring start-up, Yuanfudao (猿辅导), through investments raised the company's valuation to \$15.5 billion (Kunthara, 2020). When noting the gargantuan amounts of money within the sector, one must question the investors and their priorities to promote holistic learning experiences for students or otherwise. Investors in Yuanfudao were Boyu Capital (social media investor), Tencent (social media and gaming giant responsible for WeChat and part owner of PUBG and Fortnite, popular online based shooter games). Moreover, at the end of October 2020, Bytedance, the owner of the social media platform TikTok announced it would be releasing an edtech platform called Dali (大力) (Goh, 2020). Handing children's private data over to private edtech platforms with vested interests in social media and computer games is something that should be carefully considered, particularly with the potential amounts of money that some children are prepared to spend on games like Fortnite (Kleinman, 2019). The dangers of social media are obvious, just recently, Facebook was lambasted for facilitating adverts targeting teenage children interested in gambling, smoking and extreme weight loss in Australia (Williams et al., 2021). These examples illustrate the potential serious implications of handing children's personal data to companies without due diligence of the holistic considerations of the intentions, power and nature of such companies.

From uploading assignments into an LMS and having it reformatted, students and teachers potentially can have their work/data used by that LMS, scanned, copied and monetised (Watters, 2017). This adjoins the 'reverse pedagogy' (Perrotta et al, 2020) or the raw material which big tech gains from the collection of children's and teacher's data. As the children learn, so does the machine, at no developmental cost. In reality, the types of LMSs that track, collect data and use it for their advantage are not really free, there is a definite price to pay. The risk remains that human experience (both physical and digital) is being transformed into free raw material for the use of either improving services that

will then be sold back to the end user or creating personalised advertising profiles based on behavioural data, which is then used to commercially, socially and politically influence users in the present and even used to predict future political, commercial and social behaviour (Matz et al., 2017).

Educators are starting to open their eyes to the extent of digital scandals that have come to light such as the Snowden, Wikileaks and Cambridge Analytica incidents and realizing that we can no longer prioritize the traditional safeguarding model as children now have much more contact with online private corporations than they do with traditional online threats (such as scammers and predators). 'Knowledge is Power' (Bacon, 1597/1996) and the collection of data has now pivoted from a collection of knowledge to equate to a collection of power.

5.2.2 Due diligence of all stakeholders

Watters (2020a), Weller (2020), Williamson (2021), Selwyn (2021) and many other authors and researchers critically examining edtech, call for a change from the often unquestioning advocacy of particular technologies to a more critical understanding of their social effects. It is important to outline the benefits of edtech in terms of its potential contributions to the development of learning however focus on the disadvantages must be prioritised to avoid the blind advocacy to implement shiny, cool, unvetted technology into secondary school classrooms.

For instance, looking into the research results on data safeguarding, it is abundantly clear that teachers and leaders put their trust in the LMS and its owners to do the right thing. Yet concerns can be raised in both countries but especially in England as fast-tracked governmental facilitated access to the open-market in edtech cloud computing is provided to big data companies without any real competitive or ethical considerations. Due diligence is not only a priority, but part of a duty of care and professional competency in England and the Czech Republic and if not carried out by all stakeholders (edtech, government, local authority, SLT and teachers) can lead to the most extreme circumstances such as private gambling companies gaining access to students' data (Ungoed-Thomas, 2020). The pivot to online learning brought more time

constraint as pointed out by surveyed educators, which in turn led to even less online safeguarding.

Moreover, one aspect of using edtech in schools that can be easily omitted is that children are considered adults online from the age of 13 and as a result can have their data collected, analysed and tracked in order to create an online profile. The reasons behind the age of 13 are very questionable as it is scientifically proven that their brains, especially the prefrontal cortex which affects impulsive decision making, is still developing (Casey et al. 2008). In 2021 in England over half a million of teenagers are problem gamblers (Nairn, 2021), which may or may not be linked to the DfE breach with gambling companies. Thus when implementing any edtech tools, the school leaders and educators should have a clear understanding of all its aspects. Legally Google follows the Children's Online Privacy Protection Act (COPPA) as well as the GDPR but when looking closely at the terms of services, Google, firstly, does not clearly state what it does with the data collected of students aged 13 and above. According to the company the data gathered is only to improve current services but also to develop new ones. Secondly, the terms of service do not specify what will happen to data when a child becomes a legal adult. In an ideal scenario, the aggregated data should be automatically deleted from the platform and its additional services. Yet Google makes it very difficult to delete any data from its platform. References to this point can only be found in two paragraphs of their 'Data Processing Amendment' (Google Workspace for Education, n.d.). Its legal wording is unclear and no explicit indication of data deletion, which means any student data that the school uploaded either regarding achievements, behaviour, punctuality, special requirements could be used at a later stage (Lossec, Millar, & Teräs, 2021). This data could potentially later be used in selecting students in higher education (Dennis, 2018), when applying for a job (Heilweil, 2019), or even by insurance companies (Balasubramanian, Libarikian, & McElhaney, 2018). Presently a full profile deletion can only be done by the request from a parent/guardian to the school, who then has to ask its provider, who in turn will demand that Google deletes the data. This could be a tedious and difficult process to achieve. Only one participant in the interviews demonstrated some critical understanding of this, and this is not surprising given the complexity and depth of some of these policies. Google additionally states that the data gathered will not only be used to improve current services

but also to develop new ones (Google Workspace for Education, n.d.). There is an ethical conflict here as Google, in March of this year found itself accused of overstepping on its users' consent and in breach of the GDPR (Murgia, 2020). With this in mind, at which point is it appropriate to state that perhaps this company does not have the best interests of children at heart, particularly regarding some of its other scandals outlined in chapter 2.

Moreover, despite cloud computing safety being one of the reasons used by most school leaders for GWfE adoption, it is important to note that several security threats regarding privacy, confidentiality, integrity, and availability of data still exist as stated in the Cloud Security Alliance's report on the Treacherous 12 top threats (Walker, 2016).

5.2.3 Professional ethics

In the research results, the implementation of GWfE, drastically changed the behaviour of school leaders and educators. Prior to the pandemic, over half the educators surveyed used the platform, while during the pandemic over 90% used it extensively to improve and support their teaching. This increased use of edtech tools during the full pivot online led to the vast majority of teachers actively looking for online resources, while being aware of their own limitations regarding digital literacy and confessing not to always read the edtech tool privacy policies or terms of use. Beside the fact that this is in contradiction to the UK teaching standards on knowledge (Section 2, 3) and safeguarding (Section 3, B & G) as stated previously in Chapter 2, it also shows how the urgency during the pandemic to provide efficient teaching and learning prevailed versus online safeguarding of students' data. Only one school took the time to assess the situation and put protocols in place to guide their educators during their first lockdown.

The main risk seen associated with professional ethics is a dominance of GWfE as an LMS in secondary schools. Users become dependent on the platform and the additional services it offers which leads to the uploading of their schemes of work, lessons, marksheets and more on the Google Drive, teaching through Google Classroom, Google Forms, Google Meet, are the completion of

professional development through becoming Google certified teachers, etc. This dependency or Googlefication of secondary education does not benefit educators but risks creating a generation of dependent Google users who have saved their entire school lives within the system. After generations of open-minded, resourceful teachers, Google's business model has the potential to stifle professional judgement, creativity and autonomy in educators (Harris, 2020).

Finally this dependency is aggravated by the fast implementation and adoption of the LMS. In the qualitative research senior leaders clearly pointed out that GWfE was now integral to the institution. Yet, the adoption of this LMS is a seemingly covert implementation of Foucault's interpretation of the Benthamian panopticon in education (Foucault, 1977; Wintrup, 2017). GWfE provides further surveillance of not only the students but also of teachers, which could result "in evaluation, monitoring and quantification of their activities by the school leadership" (Lindh and Nolin, 2016, p. 659) and also governments and parents/guardians. Educators nowadays can be confronted with "a range of online communication concerns, e.g social media contact with students, online harassment from parents, or simply the impersonal ways that technologies can sometimes be used" (Selwyn & Heffernan, 2021, p. 132) while they still need to remain professional. Furthermore when questioned about either students', or parents', or educators' refusal to use the platform, exclusion was the only solution. The reasoning behind the decision being that any reluctance to use it would impede on the teaching and learning, this was found in both countries. Interestingly this decision goes against the daily practicalities of some subjects like Maths as one teacher mentioned in the survey. By forcing the adoption of GWfE upon educators, leaders are altering teachers' roles and impelled further GWfE responsibilities as part of their professional ethics albeit without consultation or consent. Outside of the classroom, digital technologies are implicated in increased expectations of availability through digital communications. Thus bringing ethical challenges not only on lack of inclusivity and on educators' rights but also potentially human rights through exclusion from education.

5.2.4 One trick pony

During the pandemic edtech offers were thrown at educators and yet incorporation of edtech tools by teachers is scarce unless they fit a purpose or a need for it is recognised that teachers are resistant to edtech tools and will only incorporate them if benefits are experienced (Howard & Mozejko, 2015). Giroux stated in an interview (França, 2019): “Education is not just about empowering people, the practice of freedom, it’s also in some ways about killing the imagination”. During the pandemic edtech companies’ offers were thrown at educators and yet incorporation of edtech tools face resistance unless they benefit teachers (Howard & Mozejko, 2015). Selwyn’s (2020) research project findings on datafication and workload in three Australian schools, showed that, unlike advertised, datafication did not simplify teachers’ lives. As described by Perrota et al. (2020) “datafication, automation, surveillance, and interoperability into digitally mediated pedagogies” are seemingly the main motors of GWfE, while claiming to be equitable for providing access to its platform from any devices but enabling a further divide between users by disregarding economical background (Lam, 2020). Thus increasing the need for a ‘shadow education’ by wealthier families, who subscribe to additional services (Williamson & Hogan, 2020) created by non-educators, who bring in their coding and algorithms their own biased learning experiences and values.

These technologies have also increased the standardisation and automation of teachers’ work, from automated feedback and grading tools, through to templated lesson planners and personalised learning systems. While these technologies are a source of support for some teachers (relieving them of repetitive and/or routine tasks), they can limit teachers’ autonomy and professional judgement (Alirezabeigi et al., 2020; Andrejevic & Selwyn, 2020) but also creates a social disconnect in pedagogy between teacher and learner, for instance in a hypothetical scenario where a parent asks a teacher how their child did in a certain test and the teacher may have to answer, ‘ask the computer, it graded it’. As the priority to make education efficient overcomes the priority to make education effective, educators must step back and weigh in on the edtech debate.

Lastly, one debatable question remains: Is this too late? Corporations can be many steps ahead of the litigation exemplified by Microsoft’s 2016 publication of

a book of policies on cloud use that would serve as recommendations for governments, industry and society on ensuring that trustworthiness, inclusivity and responsibility be adopted (Microsoft, 2016). It is imperative that educators be made aware through training or CPD of how these companies, particularly Google, can hold tremendously powerful lobbying and advisory power within the government through nefarious means such as bribing academia (Nicas, 2017) and hiring former government employees (Doward, 2016).

Whereas the nationalism of the 19th and 20th centuries intended to control the behaviour of sometimes vast empires of populace, personalised data and targeted data-based influence has dominated the 21st century. Data collection, which led to attempts at behavioural modification as witnessed in the Cambridge Analytica scandal (Confessore, 2018), has definitely now pivoted from a collection of knowledge to a collection of power. Corporations like Google have increasing power and influence in the public sphere (Grant, 1997; Roach, 2007). In fact, some corporations own more resources than small countries and have been increasing their lobbying and political power (Anderson & Cavanagh, 1996; Crane & Matten, 2010).

During the writing of this project, the researchers have observed the beginning of a backlash against Google for its lack of due diligence in regards to its abusive marketing practices (Lomas, 2021; Braun & Manancourt, 2020) and its data practices (Brook, 2020). This scrutiny turned to GWfE and in March 2021, the Dutch minister for education wrote an open letter to parliament expressing concerns over privacy risk on the platform as Google is the sole entity in control of metadata and that educational institutions have “no or insufficient control” over their own data while using GWfE. In the meantime, Dutch civil servants have ceased using Google Workspace. (NL Times, 2021). In February 2021, the General Comment number 25 was amended to the United Nations Convention on the Rights of the Child (OHCHR, n.d.). This means that states within the UN are now accountable as well as duty bearers (business) and other actors who significantly impact children. In the review process, various governments made proposals to alter the general comment. This demonstrates how some countries were more willing to accept accountability in this regard than others. For instance, the Finnish Government drew the conclusions that

“In the government’s view, it might be relevant to address children's right to privacy and research ethics here, as the digital environment makes it easier for sometimes rather disparate actors to collect data.” (Ministry of Foreign Affairs of Finland, 2020, p.3)

5.3 Limitations

While it has been attempted to identify and discuss all areas and influences relating to the question at hand, through blended quantitative and qualitative methods, it is impossible to consider all the possible variables such as values (intrinsic and extrinsic), politics, personal and interpersonal viewpoints, cultures, geographical and contemporary contexts to gain an accurate insight. The results section provides valid, contextual data consisting of 5 qualitative interviews and 73 responses to the online survey which offers critical reflection on the use of GWfE within the context of public and private Czech and English secondary schools for the use of reflection and further planning for all stakeholders including teachers, educational leaders, ministries of education or the GWfE company themselves. Valid data has been obtained from participants logically and methodically analysed through thematic coding and SPSS analysis to ascertain a true picture of the existing situation in order to provide answers. While all attempts have been made to maintain a fair, unbiased and accurate approach, there are some limitations which are possible to identify.

Due to the nature of the COVID-19 restrictions of the schools used in the project, there was an expectation for lower numbers in responses to the online survey in Czech secondary schools due to their busy and constantly changing working conditions. Additionally, some data collected in the online survey and in the interviews was not fully utilised and could be used in further study if needed.

Answers to interview questions regarding the impact on teaching ethics, standards and competencies somewhat differed. There was a general feeling of awkwardness during these questions as participants may have felt professionally questioned or attacked in the way that the questions may have placed them in a position where they felt they had to professionally protect themselves or their institution. In regard to this we are equivocal about whether

these questions were fully answered or answered in a way that would express honest opinions.

Unfortunately the sampling regarding the online survey was unbalanced due to low numbers of respondents in the Czech Republic as one of the Czech schools pulled out but also to the fact of being in another lockdown at the time of the survey, screen fatigue and as such survey fatigue were to be expected. Therefore the broadness of the study for future research could be increased as, due to COVID-19 restrictions, working conditions and time restrictions, the interview results, unlike the survey results, had not yet fully reached a saturation point (Creswell, 2013). However, at the time of conclusions, the main themes gathered from interviews and from the survey had been well identified herein that the researchers believed that the quality and content of the interviews and survey responses were sufficient.

5.4 Recommendations

5.4.1 Opacity of Google and due diligence

The results of the research call for more transparency and discourse between Google and schools in terms of their terms of use and data privacy policies. There are far too many gray areas in the wording of these policies which creates gaps in data safeguarding. As schools generally do not hold the legal nor financial ability to appraise these policies, the U.K. and E.U. governments must initiate some form of inquiry in order to align the data safeguarding expectations of schools with that of Google's policies in order to make them explicitly clear and to have child safeguarding at the very core of the policy. Interestingly over the last few years and months, China and the European Union have reviewed and amended their data safeguarding provisions on children. In 2019, China created a policy, the Provisions on Cyber Protection of Personal Information of Children (PCPPIC), to protect their data from international private enterprise (CAC, 2019). This policy was more inline with the European GDPR and the American COPPA laws but focused more on consent, while the European Union is in the process of "banning the use of

artificial intelligence for a number of purposes, including mass surveillance and social credit scores" (Vincent, 2021, para 1). These two major moves are an open-call for transparency and ethical use of data by big data corporations and to attempt to balance power towards the benefit of children, parents and educators.

Apart from the obvious need for more transparency from GWfE, school leaders and governments need to be made aware of not only the important factor of finance when implementing a new educational technology but also of the techno-ethical questions that need to be asked during the implementation process. Some of these questions developed by Selwyn and Heffernan (2021) or Krutka et al. (2019) could aid this process. However in the case of GWfE, some questions may prove difficult to answer:

- *Did students have to make an account to start using the app? If so, did they have to provide personal information (email, name, age etc.)?*
- *Does the app require parental permission? Who has access to the email and other information once students have created that account?*
- *Does the app developer share information with others? (This information is generally in the privacy policy).*
- *Does the app collect additional data such as location or contacts?*
- *What models of pedagogy does the software promote?*
- *What assumptions are made about students and learning?*
- *What are the software's core values?*
- *What does the software allow to happen that could not be done using existing means?*

(Selwyn and Heffernan, 2021)

In fact, these questions are part of a ready to use policy for appropriate use in regards to using systems like GWfE that schools can adopt and adapt that Selwyn and Heffernan have created. Thus policies can be shared with all stakeholders for more transparency.

5.4.2 Critical digital literacy of all stakeholders

One definition of digital literacy is "the ability to properly use and evaluate digital resources, tools and services, and apply it to lifelong learning processes"

(Gilster, 1997, p. 220). As such users of GWfE would learn by assembling knowledge (Bawden, 2008), and sharing the knowledge with the school community but also the whole community as outlined by the DIGCOMPEDU framework in chapter 2. Google has even created its own certification to boost this method further (Google for Education, 2020). Yet this course only applies to the context of improving teaching and learning and is only based on the basic tools the platform offers. One of our key findings was the disparity between the level of digital literacy and competency from stakeholders and their understanding of the edtech tool performance and agenda. The current level of digital literacy taught either in the Czech Republic or in England does not prepare stakeholders to fully understand how a platform like GWfE collects and reuses data. Therefore it is essential that all aspects of digital literacy be put on secondary school agenda. We would strongly recommend the development of a curriculum on data privacy and data safeguarding not only for students but also for staff.

By reducing the accountability of companies and reducing students and their assessment to numbers, it is easier to provide deductive evidence to prove that learning is occurring to allow schools to compete effectively in the league table ecosystem. This also provides increasingly strict/restrictive criteria through which schools and teachers must adhere to in order to prepare students to gain the appropriate level of evidence to compete. The level of digital competency required to understand this datafication process should match the same level for promoting or adopting edtech tools. The same scrutiny on students' datafication by educators needs to apply to the edtech tools that are implemented and as such the authors would advise prior to the adoption to run a full SWOT analysis either by the DPO or SLT but ideally also by educators, which could use Morris' (2018) and Selwyn and Heffernan' (2021) questions to assess its compliance to safeguarding standards but also to teachers' professional ethics. Once the SWOT analysis findings are deemed satisfactory a policy should be created and in consultation with stakeholders for full transparency.

6. CONCLUSION

The fast-paced implementation of edtech tools has been transforming the world of education and with the COVID-19 pandemic, their offers have been even more attractive to teachers and schools looking for ways to cope with the full pivot to online learning. In this completed study, the authors, who are also secondary school teachers, wished to engage educators and school leaders to gain a better understanding of the impacts of GWfE implementation in schools. As such, the aim of the research was to examine the impact the adoption of GWfE had on educators' professional competencies and ethics but also establish the extent to which school leaders considered data safeguarding before and during its implementation.

This paper identifies certain issues afoot and potential pitfalls for all stakeholders with recommendations for avoiding and limiting these. The theory and methodology for drawing these themes proved useful considering the limitations outlined in chapter 5. The research results indicated that the use of GWfE had exponentially increased, mostly facilitated by the COVID-19 pandemic and during this time stakeholders' voice was rarely consulted. The issues of consent and autonomy were also very relevant and findings showed that both students' and educators' autonomy had been reduced through GWfE use and that consent in some instances was viewed as almost automatic. The findings on data safeguarding were the most alarming and warrant more attention as they indicate that this is an area where educators require/want more training. Disconnections between whom accountability falls upon for this and to what extent differed greatly. As per these findings, questions were answered but these answers often birthed multiple additional questions that the researchers have already outlined in chapter 5 and any of these would form a good basis for further research into this topic.

Following from the findings in this study the authors recommend due diligence from all stakeholders when implementing any edtech tools in school environments as well as the inclusion of data safeguarding training for all stakeholders. By increasing the scrutiny on privately owned edtech tools before

implementation and by improving the level of awareness of all stakeholders through increased digital literacy teaching and learning in schools, the power balance should be slowly restored. In the meantime the authors advise for educational leaders to put in place SWOT analysis and the creation of specific policies on the edtech tools used in a school environment as well as complete transparency with all stakeholders.

Fortunately this field of research is beginning to expand. However, there is still a lack of critical studies focussed on the use of edtech within secondary schools as most of the existing research exists in tertiary education or focuses on the functionality of edtech rather than critically appraising its societal impact. Henceforth, there remains a hope that this paper contributes to this field and that additional studies will enrich the findings of this paper.

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APPENDICES**1 (1)****Appendix 1. Brief summary of commonly used LMS acronyms as outlined by Watson and Watson (2007)****CAI (Computer-Assisted Instruction) and CAL (Computer-Assisted Learning):**

Perhaps one of the oldest forms of computer based edTech. Under the supposition of individualisation and giving teachers more time, CAI was born out of a drive for standardised testing and some may argue that CAI dates back to the 1920s (Pressey, 1926). It is based on utilizing behaviourist techniques and the drill-and-practice design (Molnar, 1997). These programs focused on single loop learning (Argyis and Schon, 1974) where failed areas would be repeatedly reviewed without modification to enable the students to improve on a specific area of weakness (Stultz, 2013) and then administer more advanced work based on the students' calculated ability. We still see elements of CAI in certain types of CALL (Computer Assisted Language Learning) such as Duolingo. Also, a pioneer in edTech, CAL was invented with individualized instruction in mind. Originating from the University of Illinois in the 1960s, students were able to access learning material with linked computer terminals.

CBI (Computer-based instruction): Similar use of drill programmes as in CAI and CAL although with slightly more sophisticated tutorials.

ILS (Integrated Learning System): (forerunner of the modern LMS) management, tracking, personalised instruction, and integration

LCMS (Learning Content Management Systems): Integrate well with LMSs but the key difference is that LCMSs do not allow for individual learner management and are more focused on the creation and delivery of learning objectives though the delivery of content. LMSs and LMCSs can often be seen integrated in some way (i.e. Google Classroom vs Google Suite for education)

CMS (Content Management System): Content management systems are effectively software applications intended for the design and management of digital content in a collaborative environment.

CMS (Course Management System): They are used for online/blended learning which supports the assignment of course materials online, connecting students with courses, tracking performance, storing assignment submissions and for

enabling communication use between instructor and student. Examples include Blackboard,

1(2)

LO (Learning Objects): Digital media that can be reused to support learning. Integrated into an LMS, they would act as the smallest form of content, created and delivered within an LCMS according to each individualised learners need based on current assessment data handled by the LMS and the CMS would function as a course environment sorting content into courses and facilitating communication.

Appendix 2: Semi-structured interview guide**2(1)**

Introduction;

This interview guide contains a list of questions to cover during interview(s). It is meant to keep the interview on track and ensures that all topics are covered to answer the research question(s);

- To what extent are teachers' professional ethics and competencies considered before and during the implementation of Google Workspace for Education in secondary schools in England and the Czech Republic?
- To what extent are teachers' ethics and competences impacted by the implementation of Google Workspace for Education in secondary schools in England and the Czech Republic?
- To what extent do school leaders consider data safeguarding of stakeholders when implementing Google Workspace for Education in England and the Czech Republic?

As the premise of the interview data collection is inductive based on the theoretical framework, it is necessary for the interviews to be free-flowing and open-ended in order to gauge whether the proposed research questions above are relevant and valid within the confines of a secondary school setting. Additionally, free flowing conversation can help to uncover other areas of research or trends not previously thought of by the researchers.

- Timing 45-60 minutes per interview
- Time should be allowed between questions for interviewees to elaborate on certain answers and probes used to elicit more detail (when needed)
- The interview is structured in a way that enables the interviewer to build a rapport and trust quickly with the interviewee. An informal conversation is held first in order to establish rapport and then a statement on the purpose and interests of the research is made fully transparent
- Additionally, the interviewee is made fully aware of how the data and anonymity would be organized and protected.
- The interview is then started with a series of shorter-easy to answer questions to put the interviewee at ease and more difficult and open-ended questions are left until the end.
- At the end, a positive question based upon applications and recommendations is pitched in order to create a positive sense of constructivism to the overall interview.
- Questions can be asked in any order depending on the flow of the informal conversation at the beginning of the interview

2(2)

Question structure

How...?

How did that happen? How did you feel? How did you do that?

What...?

What happened then? What do you think about...? What was the best/worst...?

Why....?

Why did you...? Why do you think...?

Probing Questions

'How did you feel about this?'

'Was this what you expected?'

'Why do you think that is?'

'Would you tell me more about that?'

When interviewees used non-specific words, they were asked to define using the following;

'What is meant by...?'

'Who is that?'

Hypothetical

Hypothetical questions are used to allow interviewees to imagine future problems or future issues they may face now;

'What would you like to have happened?'

'Ideally, what would you envisage.....?'

Silences;

Interviewers are encouraged not to interject during silences unless the interviewee has obviously finished their point. If the interviewer feels the question was not fully answered or in enough detail, a question prompt is used.

End of interview;

Interviewees are asked if they have anything to add or if they feel if anything has been left out.

2(3)

Interview Questions- semi-structured;

General Introductory Questions		<ul style="list-style-type: none"> • For the record, could you please confirm that your school uses Google Workspace for Education as a learning management system or in any other capacities and if so, please fully describe the capacities in which it is used. • Which professional teaching competencies or teaching ethical code does your school endorse/comply to? <ul style="list-style-type: none"> ○ Are these teacher competencies and ethics school-produced and assessed or adopted from an external entity?
Platformisation of education and datification of schools	<p>Leadership</p> <p>Strategic planning</p>	<ol style="list-style-type: none"> 1. In what ways have you enabled your staff to develop the skills, competence and knowledge to safeguard student data privacy on Google Workspace for Education? 2. To what extent was the data safeguarding of stakeholders considered when implementing Google Workspace for Education? 3. Were there talks with the Trust/ LEA/ DFE regarding data privacy and safeguarding as a private LMS would be collecting students data? 4. What steps did you take to avoid a power imbalance between the data collected and used by the school and the one used by GSuite for Education?
Implementation of LMSs and leadership decisions	<p>Ethics & policies</p> <p>Professional development</p>	<ol style="list-style-type: none"> 1. When was it decided to implement such edTech into your school? 2. What were the reasons for the implementation of Gsuite for Education in your school? 3. What policies were created/reviewed to cater for this implementation? 4. Before implementation or during was a high level data map or data ecosystem created to outline the data ecosystem of your school? 5. Was some form of SWOT analysis or risk assessment created for its implementation? 6. How did you measure the cost-effectiveness of your future implementation? How did you assess its future efficacy? How did you think it would benefit the school? 7. What preparations were put in place to facilitate the adoption and the transition to Gsuite for Education?

		<ol style="list-style-type: none"> 8. To what extent or in what regard did the implementation of Google Workspace for Education include stakeholder voice? 9. In what ways could your school enrich teacher competence and knowledge of Google Workspace for Education? 10. Reflecting upon it now, what would you do differently?
Learning during the pandemic.		<ol style="list-style-type: none"> 1. Tell me about your experience with the use of Google Workspace for Education in this school before the pandemic. 2. How has the use of Google Workspace for Education changed during the pandemic? 3. Following months in Lockdown what have been the positive/negative aspects of using GSuite for Education?
Professional ethics and competencies relating to LMS use and data safeguarding		<ol style="list-style-type: none"> 1. To what extent were teachers' professional ethics and competencies considered before the implementation of Google Workspace for Education in this school? 2. If a teacher refused to use Gsuite, what would happen? 3. Are you aware of any data safeguarding issues regarding Google Workspace for Education or it's additional services either internally or externally? 4. Are you aware of any data safeguarding issues regarding Google or its parent company Alphabet? 5. Whom do you believe is accountable for any misuses of user data by Google Workspace for Education?

Appendix 3. Quantitative research: survey questions

3(1)

Info	1. What is your age range?
	2. Where do you teach?
	3. What is your gender?
	4. What is your main role?
	5. Which key stage(s) do you teach?
	6. How many years of teaching experience do you have?
	7. Which subject do you mostly teach?
	8. Describe your understanding of digital literacy in terms of information collection, information evaluation, information management, information processing, teamwork, integrity awareness, and social responsibility.
Behaviour	9. Before the COVID-19 pandemic I extensively used Google Workplace for Education to help me improve/support my teaching and learning activities.
	10. During the COVID-19 pandemic I extensively used Google Workplace for Education and their additional services to help me improve/support my teaching and learning activities.
	11. I link Educational technology tools from different sources (outside of Gsuite core services) into my Google Workspace for Education. For example, linking websites with simulations or videos to Google Classroom
	12. Prior to promoting or using any Educational technology tools, I do NOT always read their privacy policies
	13. If you do not always check the privacy policies for Educational technology tools you use in your lessons, please outline why this is so (you can select multiple options)
	14. Prior to promoting or using any edtech tools with my students, I always consult with my school and/or the school data officer/data protection officer.
Attitudes	15. While using Google Workspace for Education (Classroom, GDrive, Google Forms, etc) and its Additional Services (Youtube, Translate, Lens, etc), I believe that students' data (names, location, device identifiers, IP address, etc.) is secure on the platform.
	16. My use of Google Workspace for Education and its services, like Classroom, Google Forms and Gdrive, Youtube, is compliant with GDPR and other national data protection regulations
	17. As a teacher, I believe I am ultimately and solely responsible for the safeguarding of students' data through the use of Google Workspace for Education in your school or any other Edtech tools
	18. If you disagree with the previous statement, who do you think has the responsibility to safeguard students' data when a private Educational technology tool like Google Workspace for Education is adopted in your school? (you may choose multiple options)
	19. When private Educational Technology tools like Google Workspace for Education are implemented in schools, I believe my consultation does not need

	to be sought
Knowledge	20. While using Google Workspace for Education and its Additional Services, I have increased the collection of student data and thusly increased the tracking of student digital behaviours
	21. While using Google Workspace for Education and its Additional Services, my professional ethics/standards/code of conduct/competencies have been contradicted
	21 (i). If you answered agree for the last question, please outline which competencies have been affected and how.
	22. I am fully aware of incidents of unethical data practice with Google or its affiliate companies (either domestically or internationally).
	22 (i). If you answered that you are aware of unethical data practices, can you briefly outline what you are aware of.
	23. Considering the increased use of new educational technologies in my classroom, I know that my professional development is adequate and relevant enough to safeguard my students' data.
	24. After taking this survey, I would like more professional development in this area of digital literacy
	If you have any other comments, views or feedback in general about the questions in this questionnaire, please write them here:

Appendix 4. Demographic results

4(1)

1. What is your age range?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-25	4	5.5	5.5	5.5
	26-40	42	57.5	57.5	63.0
	41-56	22	30.1	30.1	93.2
	57+	5	6.8	6.8	100.0
	Total	73	100.0	100.0	

2. Where do you teach?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Czech Republic	28	38.4	38.4	38.4
	England	45	61.6	61.6	100.0
	Total	73	100.0	100.0	

3. What is your gender?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	48	65.8	65.8	65.8
	Male	22	30.1	30.1	95.9
	Prefer not to say	3	4.1	4.1	100.0
	Total	73	100.0	100.0	

4(2)

4. What is your main role?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Language Teaching assistant	1	1.4	1.4	1.4
	Librarian	1	1.4	1.4	2.7
	LSA (Learning Support Assistant)	4	5.5	5.5	8.2
	Middle leader (e.g. Head of Department/Head of Year)	12	16.4	16.4	24.7
	Senior leader	10	13.7	13.7	38.4
	Teacher	27	37.0	37.0	75.3
	Teacher with responsibility (e.g. subject curriculum leader)	18	24.7	24.7	100.0
	Total	73	100.0	100.0	

8. Describe your understanding of digital literacy in terms of information collection, information evaluation, information management, information processing, teamwork, integrity awareness, and social responsibility.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I do not really understand what is being referred to as digital literacy and I would like to know more	5	6.8	6.8	6.8
	I fully understand the seven domains of digital literacy described above.	7	9.6	9.6	16.4
	I somewhat understand the seven domains of digital literacy described above but I have a stronger understanding of some domains more than other domains	31	42.5	42.5	58.9
	I somewhat understand what is being referred as digital literacy but I have limited knowledge of each domain	30	41.1	41.1	100.0
	Total	73	100.0	100.0	

Appendix 6. Spearman Correlations results**6(1)****6.1 Correlation between age and Q12 on consultation of privacy policies****Correlations**

		age		12. Prior to promoting or using any Educational technology tools, I do NOT always read their privacy policies.
Spearman's rho	age	Correlation Coefficient	1.000	-.233*
		Sig. (2-tailed)	.	.047
		N	73	73
	12. Prior to promoting or using any Educational technology tools, I do NOT always read their privacy policies.	Correlation Coefficient	-.233*	1.000
		Sig. (2-tailed)	.047	.
		N	73	73

*. Correlation is significant at the 0.05 level (2-tailed).

6.2 Correlation between Q14 & 17**Correlations**

		14. Prior to promoting or using any Edtech tools with my students, I always consult with my school and/or the school data officer/data protection officer.		17. As a teacher, I believe I am ultimately and solely responsible for the safeguarding of students' data through the use of Google Workspace for Education in your school or any other Edtech tools.
Spearman's rho	14. Prior to promoting or using any Edtech tools with my students, I always consult with my school and/or the school data officer/data protection officer.	Correlation Coefficient	1.000	.288*
		Sig. (2-tailed)	.	.014
		N	73	73
	17. As a teacher, I believe I am ultimately and solely responsible for the safeguarding of students' data through the use of Google Workspace for Education in your school or any other Edtech tools.	Correlation Coefficient	.288*	1.000
		Sig. (2-tailed)	.014	.
		N	73	73

6.3 Correlations between Digital literacy and Q22 and Q23

6.(2)

Correlations

		Digital Lit		22. I am fully aware of incidents of unethical data practice with Google or its affiliate companies (either domestically or internationally).	23. Considering the increased use of new educational technologies in my classroom, I know that my professional development is adequate and relevant enough to safeguard my students' data.
Spearman's rho	Digital Lit	Correlation Coefficient	1.000	-.470**	-.363**
		Sig. (2-tailed)	.	.000	.002
		N	73	73	73
	22. I am fully aware of incidents of unethical data practice with Google or its affiliate companies (either domestically or internationally).	Correlation Coefficient	-.470**	1.000	.011
		Sig. (2-tailed)	.000	.	.929
		N	73	73	73
	23. Considering the increased use of new educational technologies in my classroom, I know that my professional development is adequate and relevant enough to safeguard my students' data.	Correlation Coefficient	-.363**	.011	1.000
		Sig. (2-tailed)	.002	.929	.
		N	73	73	73

** . Correlation is significant at the 0.01 level (2-tailed).

6.4 Correlation between Q15 and Q16

		15. While using Google Workspace for Education (Classroom, GDrive, Google Forms, etc) and its Additional Services (Youtube, Translate, Lens, etc), I believe that students' data (names, location, device identifiers, IP address, etc.) is secure on the platform.	16. My use of Google Workspace for Education and its services, like Classroom, Google Forms and Gdrive, Youtube, is compliant with GDPR and other national data protection regulations.	
Spearman's rho	15. While using Google Workspace for Education (Classroom, GDrive, Google Forms, etc) and its Additional Services (Youtube, Translate, Lens, etc), I believe that students' data (names, location, device identifiers, IP address, etc.) is secure on the platform.	Correlation Coefficient	1.000	.471**
		Sig. (2-tailed)	.	.000
		N	73	73
	16. My use of Google Workspace for Education and its services, like Classroom, Google Forms and Gdrive, Youtube, is compliant with GDPR and other national data protection regulations.	Correlation Coefficient	.471**	1.000
		Sig. (2-tailed)	.000	.
		N	73	73

** . Correlation is significant at the 0.01 level (2-tailed).

6.5 Correlations between Q17 and 20

6(3)

Correlations

	17. As a teacher, I believe I am ultimately and solely responsible for the safeguarding of students' data through the use of Google Workspace for Education in your school or any other Edtech tools.		17. As a teacher, I believe I am ultimately and solely responsible for the safeguarding of students' data through the use of Google Workspace for Education in your school or any other Edtech tools.	20. While using Google Workspace for Education and its Additional Services, I have increased the collection of student data and thusly increased the tracking of student digital behaviours.
Spearman's rho	Correlation Coefficient		1.000	.301*
	Sig. (2-tailed)		.	.032
	N		51	51
	20. While using Google Workspace for Education and its Additional Services, I have increased the collection of student data and thusly increased the tracking of student digital behaviours.	Correlation Coefficient	.301*	1.000
	Sig. (2-tailed)		.032	.
	N		51	51

*. Correlation is significant at the 0.05 level (2-tailed).

6.6. Correlation between Digital Literacy and Q22 for UK and Cezch Republic

	Digital Lit		22. I am fully aware of incidents of unethical data practice with Google or its affiliate companies (either domestically or internationally). UK	22. I am fully aware of incidents of unethical data practice with Google or its affiliate companies (either domestically or internationally).CZECH
Spearman rho	Correlation Coefficient		-.512**	.379*
	Sig. (2-tailed)		0.000	0.047
	N		45	28

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